Development of Professionalism: Case Study of HIV/AIDS-related Stigma among Healthcare Students

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“The world is divided into men who have wit and no religion and men who have religion and no wit.”

Avicenna

Foreword

As healthcare students progress through their training, and learn about their professional identity and professional duties, is their personal identity also affected? For example, as healthcare students learn how to provide care to an HIV positive patient by leaving the attitudes they hold about homosexuality outside; would they want that HIV positive person as a friend? Does professionalization process only reduce the stigmatizing attitudes about HIV/AIDS within the sphere of healthcare or it reduces the stigmatizing attitudes globally? We hypothesized that healthcare students stigmatizing attitudes may branch off between a *professional* domain and a *personal* domain.

In this thesis we attempt to explore the idea of professionalization of social attitudes of [future] healthcare professionals, by studying the disease-related stigmatizing attitudes of undergraduate pharmacy and medical students of an Australian university and a Malaysian university. We bring together two concepts i.e., professionalism – professional development – and stigmatization to examine the idea of bifurcation of social attitudes in relation to professionalism and personal values.

We employed the techniques from medical education research; social-epidemiology; and methodological research to investigate the process of professional development in relation to disease-related stigmatizing attitudes. As we needed to ensure the existence of the disease-related stigma, we chose a classic example of

stigmatizing disease i.e., Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS).

When applied singly, medical education and epidemiology approaches to study professionalism and stigma focus on certain aspects of the matter. The epidemiological research on HIV/AIDS puts a high premium on the fight against the social repercussion of being HIV positive. One of the main focuses of HIV/AIDS-related epidemiological research is to alleviate the suffering of those who are affected by the disease through social and psychological interventions.

In medical education, however, the focus is on the principles of evidence-based education, as well as, understanding the underlying factors that affect the learning. For example, how could the healthcare students learn better about their professional roles and duties such as clinical decision making skills; problem solving skills; or how could the educators improve and advance the clinical assessment methods.

This thesis does not take stance on complying with the principles of pure medical education research or theoretical epidemiology research. Rather it serves the socio-epidemiological view of HIV/AIDS-related stigma as a case study to investigate the professionalism and professional development. We have tried to marry professionalism and HIV/AIDS-related stigma, by standing on common ground. That is looking at professionalism from a social perspective and not purely

an educational viewpoint; and, also, looking at HIV/AIDS-related stigma from an educational lens and not purely from a psychosocial view point.

Our attempt to stand on common ground has resulted every so often in taking unorthodox and bold decisions, and we are very well aware of their limitations. For example, we have operationalized professionalism by adopting the years spent in the health program to be the only reasonably available proxy for professional development. Although, we have not relied on a set of clinical skills and expertise – like most of the medical education literature – as proxies of professionalism; nonetheless, we feel our approach reflects a true picture of measure of professionalism in the context of HIV/AIDS-related stigma. We hope that our approach could pave the path towards innovative methods that would enable future researchers to marry the concepts that seem to be, otherwise, incompatible.

This thesis consists of seven chapters; and to ease the transition from one chapter to another, every chapter starts with a preamble. The preamble reminds the reader about what was presented in the previous chapter; and what the reader should expect to read in the coming chapter.

I have used the first plural pronoun "*we*" widely in referring to my PhD research activities; because I see the PhD as a collaborative adventure that needs a close liaison with the supervisors. However, ultimately, I have been the one who has carried out the research; and I will take full responsibility for the work presented here; and also take full ownership of this PhD work.

Summary

A healthcare workforce that is responsive and fair in its treatment of patients is one of the central pillars of a modern health system (1). It is for this reason, among others, that healthcare workers are ethically bound to treat patients according to their need, and not according to their gender, religious beliefs, sexual orientation, skin color, or other socially (de)valued attribute. Within a modern healthcare program, there is also a focus on professional ethics and professional practice – often implicit rather than explicit probably increasing with the shift from pre-clinical to clinical years in a program. Hence, the years of training become a reasonable indicator of professionalization.

A professional, however, is not simply brought into being. They are developed over time. When a student starts healthcare professional course, they would not be steeped in the ideas of the profession. By the time they have finished their university training, they may not be a fully-fledged professional, but they will, we would anticipate, be more professional.

There is some anecdotal evidence, and preliminary empirical evidence to suggest that professionalization will affect attitudes in a healthcare setting, but will have a weaker effect on attitudes associated with the private, social sphere of a healthcare workers life (2). The conception and compilation of the code of professional conducts could be an explanation for the bifurcation of social attitudes. What one feels personally, should not affect the professional performance of that individual which subsequently should not affect the equality of the service provided.

The Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) is a highly stigmatized condition(3–14). People with HIV have been divorced, thrown out of their homes and driven from their villages and lost their jobs (5); all because of that discrediting attribute. People with HIV have also been denied access to treatment and care by health professionals for the same reason (15),which has challenged the equitable delivery of services (3,16,17).

There is some evidence to suggest, however, that there has been a bifurcation of social attitudes. One recent study suggested that health professionals may mentally 'juggle' two dissonant attitudes towards people living with HIV/AIDS (PLWHA), a professional attitude of fair treatment without regard to HIV status of the patient, and a social attitude of antipathy (18). In a lay, social sphere, HIV/AIDS remains a stigmatized condition(19–23).

An interesting and important question arises from the bifurcation of social attitude. As healthcare professionals progress through their training, and acquire the norms of the profession including appropriate ethical practice and behavior, do their stigmatizing attitudes about HIV/AIDS reduce globally? Or, do their attitudes change within the limited sphere of the healthcare setting, leaving the attitudes they hold about the disease outside the healthcare untouched? Crudely, you might be prepared to treat the person, but would you want them as a friend? There is some anecdotal evidence, and preliminary empirical evidence to suggest that professionalization will affect attitudes in a healthcare setting, but will have a weaker effect on attitudes associated with the private, social sphere of a healthcare workers life (2).

This question is important because it provides insight into the process of professionalization within healthcare professionals, and it provides insights into the process of managing disease related stigma in healthcare and non-healthcare settings.

We hypothesized the following in our attempt to answer the question of what is the relationship between the professional development and changes in HIV/AIDS-related stigmatizing attitudes. The hypotheses were:

1. Healthcare students will demonstrate significant levels of disease related stigma.
2. The levels of disease related stigma among healthcare students will decrease significantly with increasing levels of professionalization.
3. On average, healthcare students will evaluate disease in healthcare situation in a less stigmatizing fashion than disease in social/private situation.
4. The rate of decreasing disease related stigma associated with increasing levels of professionalization will be greater for evaluations of disease in healthcare situations than for evaluations of disease in social/private situations.

We created and validated a measurement tool to measure the levels of HIV/AIDS-related stigmatizing attitudes in two domains. That is a professional domain and a personal domain. Each domain represented the *type* of stigmatizing attitudes in each participant. We chose a novel non-parametric item response theory approach i.e., Mokken Scale Analysis (MSA) technique to develop and validate a brief unidimensional measure of personal domain of HIV/AIDS-related stigmatizing attitudes. We applied the Principal Component Analysis (PCA) technique to validate

the measure of professional stigma scale. The initial items of the professional stigma scale were developed using modified Delphi technique.

We administered the validated questionnaire to undergraduate medical and pharmacy students of Monash University in Australia and Malaysia in a two point-in-time fashion. The first round of data was collected during the first 2 months of the first semester of the Monash academic year i.e., March and April. The second round of data was collected during the *'study vacation'* of the second semester i.e., October. The study vacation is the period in which students prepare for their exams – prior to the end of semester exams – when there are no teaching activities. There was, on average a 6-month time gap between the two data collections points. We also administered the validated questionnaire to undergraduate pharmacy students of Universiti Sains Malaysia (USM) in the month of October. At USM, academic calendar starts in the month of September.

The ideal design for this research would be a 4-year to 5-year longitudinal study of healthcare students measuring changes in attitude over their professional course; however, an alternative approach was proposed to limit the resource expenditure while providing a good indication of the idea's merit. Instead of a longitudinal design, a serial cross-sectional design (to examine differences between cohorts in different years of study) – please refer to *Study I* and *Study II* – was combined with a two-point in time longitudinal design (to examine differences between the beginning and the end of a single year of study) – please refer to *Study III*. Levels of stigma were measured once at the beginning of a single year of study and once at the end of the same year, and this was conducted across year cohorts.

Study I was a cross-sectional survey of undergraduate pharmacy and medical students of Monash University in Australia and Malaysia. The fundamental finding of Study I was the 'bifurcation' of HIV/AIDS-related stigmatizing attitudes amongst healthcare students. As healthcare students became more professionalized their HIV/AIDS-related stigmatizing attitudes diverge across two domains:

1- The professional domain in which the behavioral intentions towards PLWHA are work related in a health working environment.

2- The personal domain in which the behavioral intentions towards PLWHA are at personal levels and in private situations.

The HIV/AIDS-related stigmatizing attitudes, showed a significant –although small – decline for every year spent in the health programs i.e., pharmacy and medicine. The decline in the HIV/AIDS-related stigmatizing attitudes indicates the professionalization of HIV/AIDS stigmatizing attitudes amongst [future] healthcare professionals.

Study II was a cross-sectional survey of undergraduate pharmacy students of Monash University Malaysia and USM. The two main findings were: 1) there were differences in HIV/AIDS-related stigmatizing attitudes between universities; 2) overall, the older cohorts did not show lower levels of HIV/AIDS-related stigmatizing attitudes. Although, Monash University pharmacy students showed a decline in the personal and professional HIV/AIDS-related stigmatizing attitudes, USM pharmacy students did not show significant decline in their stigmatizing attitudes. Moreover, there was no bifurcation of HIV/AIDS-related stigmatizing attitudes. We discussed the absence of bifurcation of stigmatizing attitudes and

differences in professionalization of stigmatizing attitudes among Monash University and USM students by further exploring the differences in their curricula and teaching and learning activities.

In *Study III* we collected the data in two points in time from undergraduate pharmacy and medical students of Monash University in Australia and Malaysia. There was an average a 6-month time period between the two data collection. The bifurcation of HIV/AIDS-related stigmatizing attitudes was present at the first point of data collection; however, the bifurcation was absent at the end of the 6-month period. We attempted to identify the reason(s) why the hypothesized relationship between professionalization and changes in stigmatizing attitudes did not hold.

Publications and Presentations

Publications by the candidate produced during candidature from the thesis

Ahmadi K, Reidpath DD, Allotey P, Hassali HA. Professionalisation and Social Attitude: a protocol for measuring HIV/AIDS-related stigma among healthcare students. BMJ Open 2013;**3**:e002755.

Ahmadi K, Reidpath DD, Allotey P, Development of Professionalism: Case Study of Stigma among Undergraduate Pharmacy Students of Two Universities. Pharmacy Education. February 2015 (Conference Abstract)

Ahmadi K, Reidpath DD, Allotey P, Divergence in the professional and the personal attitudes: A study of professionalism. Academic Medicine (Under review)

Ahmadi K, Reidpath DD, Allotey P, Hassali HA. A latent trait approach to measuring HIV/AIDS related stigma in healthcare professionals. BMC Medical Education (Under review)

Publications by the candidate produced during candidature not from the thesis but relevant to the thesis

Ahmadi K, Hasan SS, Ahmadi K. The health professionals' right to refuse: Is good, bad or ugly? International Journal of Pharmacy Practice 2015; 23(1):92. doi:10.1111/ijpp.12121

Reidpath DD, **Ahmadi K**. A novel nonparametric item response theory approach to measuring socioeconomic position: a comparison using household expenditure data from a Vietnam health survey, 2003. Emerg Themes Epidemiol. doi: 10.1186/1742-7622-11-9, August 2014.

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Awards

- Monash University Higher Degree Research (HDR) scholarship.
- Monash University Three Minute Thesis (3MT) 2011 competition, Jeffrey Cheah School of Medicine and health sciences, Sunway Campus, Third place.

General Declaration

Monash University

Declaration for thesis based or partially based on conjointly published or unpublished work

In accordance with Monash University Doctorate Regulation 17.2 Doctor of Philosophy and Research Master's regulations, the following declarations are made:

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes four original papers published in peer-reviewed journals and two unpublished papers which have been submitted. The core theme of the thesis is the bifurcation of social attitudes towards people living with HIV/AIDS amongst medical and pharmacy students.

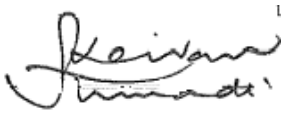
The ideas, development and writing up of all the papers in the thesis were the principal responsibility of me, the candidate, working within the School of Medicine and Health Sciences, Monash University, Sunway Campus under the supervision of Professor Dr. Mohamed Azmi Ahmad Hassali , Professor Dr. Daniel Diamond Reidpath and Professor Dr. Pascale Allotey.

The inclusion of co-authors reflects the fact that the work came from active collaboration between the researchers and acknowledges input into team-based research.

Thesis chapter	Publication title	Publication status*	Nature and extent of candidate's contribution
Methodology	Professionalisation and social attitudes: a protocol for measuring changes in HIV/AIDS-related stigma among healthcare students.	Published	I developed the concept and made substantial intellectual contribution to the manuscript. I wrote the first draft and proofread it.
Conclusion	A Proposal to Help Achieve Equitable Treatment of Transgender People in the Health System.	Published	I developed the concept and made substantial intellectual contribution to the manuscript. I wrote the first draft and proofread it.
Discussion	The health professionals' right to refuse: is it good, bad or ugly?	Published	I developed the idea and made substantial intellectual contribution to the manuscript. I wrote the first draft and proofread it.
Discussion	Professionalism in Pharmacy: A Continual Societal and Intellectual Challenge	Published	I developed the idea and made substantial intellectual contribution to the manuscript. I wrote the first draft and proofread it.
Results (Study II)	Development of Professionalism: Case Study of Stigma among undergraduate pharmacy students of two universities	Accepted abstract	I developed the concept and made substantial intellectual contribution to the abstract. I wrote the abstract and proofread it.
Results (Study I)	Divergence in the professional and personal attitudes of medical and pharmacy students towards people living with HIV/AIDS: A study of professionalism	Submitted	I developed the concept and made substantial intellectual contribution to the manuscript. I wrote the first draft and proofread it.
Methodology	A latent trait approach to measuring HIV/AIDS related	Submitted	I developed the concept and made substantial

	stigma in healthcare professionals		intellectual contribution to the manuscript. I wrote the first draft, carried out the statistical analysis and proofread the manuscript.

I (have / have not renumbered sections of submitted or published papers in order to generate a consistent presentation within the thesis.

Signed: 

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Above all, I am hugely thankful to my wife "**ERIKO**" for her patience; and for being *the* ultimate source of encouragement and support when I needed them the most.

Glossary

List of Abbreviations

HIV	Human Immunodeficiency Virus
AIDS	Acquired Immune Deficiency Syndrome
UNAIDS	The Joint United Nations Programme on HIV/AIDS
PLWHA	People Living With HIV/AIDS
WHO	World Health Organization
PAHO	Pan American Health Organization
ABIM	American Board of Internal Medicine
FGD	Focus Group Discussion
B.Pharm	Bachelor of Pharmacy
MBBS	Bachelor of Medicine, Bachelor of Surgery
ANCOVA	Analysis of Covariance
MUHREC	Monash University Human Research Ethics Committee
MRO	Monash Research Office
USM	Universiti Sains Malaysia
MSA	Mokken Scale Analysis
IRT	Item Response Theory
MH	Monotone Homogeneity
DH	Double Monotonicity
AISP	Automated Item Selection Procedure
IIO	Invariant Item Ordering
MIIO	Manifest Invariant Item Ordering

PCA	Principal Component Analysis
GEE	Generalized Estimating Equations
SD	Standard Deviation
DiD	Differences-in-differences

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INTRODUCTION

"…everyone now is mobilized around universal access to antiretroviral therapy, but have we reached our goals to eliminate stigma, shame and discrimination?"

Canon Gideon Byamugisha

1.1 Background

A healthcare workforce that is responsive and fair in its treatment of patients is one of the central pillars of a modern health system (1). It is for this reason, among others, that healthcare workers are ethically bound to treat patients according to their need, and not according to their gender, religious beliefs, sexual orientation, skin color, or other socially (de)valued attribute (24). Possible exceptions would be when those attributes may affect the diagnosis, prognosis, or choice of the most effective treatment. What should happen, however, when the patient is perceived as a complete reprobate – a repugnant individual whose very presence challenges the healthcare worker's moral foundation? In theory, the answer is simple – treat the patient in front of you according to their healthcare need – period!

The challenge for the health system is that practice is often different. The literature is replete with examples of patients who are accorded different (worse) treatment because of some perceived moral taint.(25) The human immunodeficiency virus (HIV) epidemic provides a classic case in point. Healthcare workers reported not wanting to treat people living with HIV-AIDS (PLWHA) for a range of reasons including, because they were undeserving, or because treating PLWHA would devalue the healthcare worker in the eyes of others (26). This has, in many instances, created a tiered health system in which “deserving” patients receive treatment and the “undeserving” do not (25). High levels of stigma and discrimination are associated with a reduction in access to treatment and care for those with undesirable attributes (15).

To overcome the dangers of discrimination associated with the social valuation of HIV/AIDS patients, many teaching programs now contain explicit or integrated learning objectives that relate to professionalization (27). The process of professionalization fosters the enculturation of acceptable practice of healthcare workers in line with the societal expectations and the social contract between the client and the healthcare worker (28). In this context, increasing professionalization is as much about improved technical competency as it is about ethics of practice. Increasing professionalization is also expected to result in less stigma and discrimination in healthcare settings (29).

Whether professionalization protects against the creation of tiered healthcare is an empirical question. One could argue that increasing professionalization of a healthcare worker will result in a decrease in negative attitudes and discriminatory behavior towards patients especially those from socially marginalized groups e.g., HIV/AIDS patients. There is already some evidence in the literature to support this idea (30,31). Specifically, it is known that targeted learning focused on attitudes to specific marginalized groups can result in a positive change (2). What is less clear is whether a generic focus on professionalization, often implicit in healthcare education is sufficient to improve attitudes towards all socially marginalized groups regardless of the socially devalued attribute. The distinction between generic professionalization and targeted learning is an important one, because it goes to the heart of ensuring a responsive and fair health system (2).

There are clear benefits to professionalization, within the context of health systems. For instance, a clinically based, competency-based health curriculum could prepare a healthcare force with increased clinical service capacity in providing a

better quality care to the patients (32). However, there is no reason to assume that the equanimity possessed in the professional domain will translate into the private sphere of health professionals. Likewise, there is some evidence that one's personal attitudes can affect the execution of one's professional duties (33) Earlier investigations of social attitudes among [future] healthcare professionals have clearly depicted discordant attitudes in personal and professional domains (34). We pose a hypothetical example to draw a clear distinction between personal and professional domains of attitudes of a healthcare professionals. For example, as a healthcare professionals I may be "blind" to the fact that a person is a pedophile for the purposes of treating their myocardial infarction, but my vision might be restored if there is some indication that they are joining my social circle.

One could also argue that increasing professionalization will result in a bifurcation of social attitudes and behavior of healthcare workers towards marginalized people (34,35). Specifically, while negative attitudes towards the socially marginalized may decrease with increasing professionalization, for the purposes of providing treatment and care, the same change in attitude may not be observed towards the socially marginalized in the personal domain (35).

The proposed PhD research will extend earlier research (10,12,14,17,36) by examining the relationship between the stage of professional development and the kinds of stigmatizing attitudes held about people living with HIV/AIDS. The primary main objective of this study is to investigate the relationship between the stage of professional development of healthcare students and the kinds of stigmatizing attitudes held about people living with HIV/AIDS. More specifically, we aim at measuring the attitudes of students towards PLWHA to assess (a) the level of

stigmatizing attitudes, and (b) differences between attitudes in professional and private domains.

LITERATURE REVIEW

2.1 Professionalism and Professionalization

In this thesis we have used *professionalism* and *professionalization* as two different entities. In the most elementary sense, 'professionalism' is a set of norms which permit the members of an occupation i.e., social group, to make a living via economical support system, while controlling their own work (37,38). Economists and medical ethicists recognize professionalism as an 'essential mediating force in patient care'(39). Professionalism' as a 'set of attitudes and behaviors believed to be appropriate to mark a collection of individuals with a calling [vocation] (Merriam-Webster Dictionary in (Gaiser 2009) (40).

Whereas, professionalization is a longitudinal process of acculturation and situational awareness that needs a continuous educational environment i.e., training in a healthcare course (41–43). In the educational environment the healthcare students are constantly educated and reminded about the traits of the profession; and the importance of internalizing professionalism (42).

Nonetheless, the definitions of professionalism are not without their own limitations; (38) and a full discussion of such limitations is beyond the scope of this write-up and is, somehow, least relevant to the contents of this thesis. The point to bear in mind, however, is that professionalism is entangled with the societal interactions between the member of the profession and the members of the society.

There are numerous ways of expressing the concept of professionalism. For example; professionalism includes assuming responsibility, demonstrating a commitment to excellence, peer respect, displaying honesty and integrity, and demonstrating care and compassion (27). Or professionalism as a concept is

amalgamation of morality and honesty resulting in the betterment of performance (44).

In the medical context professionalism has been defined without necessarily reaching agreement (45),nevertheless, these definitions are congruent where the concept of professionalism can be operationalized in the context of a societal expectation and social contract between the health professionals and the patients(28,46–51). Van Mook defined 'medical professionalism' by exploration of Smith's notion. Smith defined 'medical professionalism', by the essentials qualities of a physician: 1- embrace being a physicians, 2- caring and altruistic, 3- honesty, 4- integrity, 5- team player, 6- strive for excellence, 7- accept the duty of serving patients and society, 8- courage and heroism regardless of working hours (27). Van Mook designated 'expertise', 'ethics' and 'service' as three pillars of the concept of medical professionalism,(45) without which medical professionalism would subside. Van Mook's definition would be used to attend to professionalization in the healthcare profession in this research.

Professional development, in the health literature, is viewed as a learning process that enables healthcare students to construct independent personal and professional identities (34,52,53). The professional identity is the outcome of formal and informal learning during and after completing a professional course (54–56). Professional codes of conduct, internationally, are clear about the behavior expected of qualified healthcare professionals. Consistent among the expectation is that patient care should be based on need and not social position (57,58). Notwithstanding the expectations, the literature is replete with examples of health professionals who have failed to demonstrate their professional identity while providing care to their patients (59). One of the reasons for the failure to uphold the professional identity is the

stigmatizing attitudes of health professionals because of perceived moral failing of their patients (30,60).

As healthcare students become more professionalized over time by learning the norms of the profession via specialized training (38,61,62) i.e., attending the health courses for a prescribed period; they acquire the knowledge and self-reflective capacities. Such skills should enable the [future] health professionals to cope with uncertainties, including non-routinized and conflicted situations of practice (63).

In the context of future healthcare professionals, the years towards the professional development could be considered as the only clearly available proxy for professionalization. Clinical knowledge, as well as knowledge of contagion and transmission will increase with years in a healthcare program. Within a modern healthcare program, however, there is also a focus on professional ethics and professional practice – often implicit rather than explicit probably increasing with the shift from pre-clinical to clinical years in a program. Under these circumstances the years of training becomes a reasonable indicator of progressive professionalization.

Professionalization is a continuous process of acquiring knowledge, learning ethics and being prepared to serve the patients and society (45), where one may or may not choose to stigmatize PLWHA in a personal context. One might be prepared to treat the person, but would one want them as a friend? During the course of professional development, the health profession students are expected to develop their professional identity. The students gradually and periodically receive a cumulative sets of ethics and code of professional conduct (38). Thus, by spending more time in a professional [health] course, one is expected to become more professionalized. The skills learned during the course of professional development

should enable the [future] health professionals to provide care to all of their patients (63).

The conception and compilation of the code of professional conducts could be an explanation to the bifurcation of social attitudes. What one feels personally, should not affect the professional performance of that individual which subsequently should not affect the equality of the service provided. Conversely, what matters the most is the transformation of stigma over the period of time. The professionalization of stigma is a process of transforming one's professional feeling, while retaining the same private feeling. As healthcare professionals progress through their training, and acquire the norms of the profession i.e., becoming professionalized, do their attitudes about HIV/AIDS reduce globally? That is if the professionalization reduces their HIV/AIDS-related stigmatizing attitudes from the professional as well as the personal point of view.

It is crucial to consider the fact that one's behavior may not be necessarily congruent with one's attitude. The hypothesis is that socialization into profession takes place in three phases, each involving some learning of the cultural content of the role and some self-identification with it (64). The first phase, involves the focusing the attention from the broad, socially derived goals to the goal of the proficiency in specific work tasks. During the second phase, certain significant others in the work milieu become the main reference group, as one searches for role models. The third phase is valuing the occupational group and adopts the behaviors it prescribes. These three steps though may overlap but are sequential (64). It is important to remember that students can be socialized either "negatively" or "positively". If a student comes into a program with values incompatible with those

of the profession and the academic program, has negative role models and learns to practice in an unprofessional environment, there is a probability that student will neither develop nor exhibit a high level of professionalism (65).

2.2 Stigma and stigmatization

The term stigma comes from the Greek and was used to associate the scarred physique with the abhorrent morals and evil characteristics (66). In Christian times, the term stigma was further advanced with the addition of the *layered metaphor* into the definition of stigma. The first layer referred to the eruptive blossoms on the skin, which were perceived as sacred elegance. The second layer referred to the physical scars symbolizing the medical insinuation with religious allusion. These layered metaphors were holiness and religious insinuations, associated with bodily marks, (66) which brought in a sense of positivity to the negatively perceived concept of stigma. However, in today's social sciences stigma is referred to the public contempt than to the physical abnormalities (66).

Goffman defined stigma as a socially 'discrediting attribute', affecting the perception of a person by the society, hence reducing that person's 'value' [1](68). Value, in sociology, is defined as something ultimately good, proper or desirable in human life (67). Values are embodied in words through which they influence behavior (67). Goffman proposed a double perspective for the term stigma with the likelihood of a particular stigmatized individual experiencing two situations. That is, first, if the stigmatized individual's differentness is already known or becomes

[1]In an economic sense value is the degree to which objects are desired; especially it could be measured by how much one is willing to give up to get it.(67)

known immediately, then that attribute is a "*discredited"* trait or "visible stigma" (69). Second, if the stigmatized individual's differentness in neither known about or immediately perceivable, then that attribute is "*discreditable"* trait or "hidden stigma" (69). Stigma as described by Goffman was less about the attribute itself, than it was about the social devaluing process that resulted in a tainted and discounted person in the eyes of the society. He classified stigma into three categories: 1) Abominations of body e.g. physical defects, 2) Blemishes of individual character e.g. mental illness, 3) Tribal stigma of race, nation and religion (66). The three categories have the element of "differentness" in common i.e. the physical (body defects), mental and genetic (race) differences.

Goffman's definition is not 'flawless'; nonetheless, it has served as a reference point for investigating stigma (4,6,9,11,18,36,70–100). For instance, Goffman defines stigma as a negative concept with interpretation of probable undesirable aftermaths. The Pan American Health Organization (PAHO 2008) reported a positive consequence to the negative concept of stigma, where being stigmatized had created a sense of community among stigmatized individuals motivating them to support each other(101). Goffman, also, refers to the possession of a "spoiled identity" as an etiology to stigmatization, however, it is not clear whether the possession of such perceived wrong characteristic will initiate and/or retain the stigmatizing behavior. If a stigmatized individual denounces his/her "spoiled identity" would that help to stop the stigmatization?

Stigma is referred to as a complex concept (8,11,102) that has incorporated changes over time (103). We state some of the changes that have largely contributed to the expansion of literature on the concept of stigma. Miles, unlike Goffman (68),

defines stigma without using the term 'spoiled identity'. Miles defined stigma as a societal process which isolates an attribute from a set of attributes and evaluates it as undesirable and devalues the individual who possesses it (104). The isolated or singled out attribute becomes so dominant, that the person possessing it is defined in terms of that one devalued attribute (77). For example, the stigmatized individual becomes known by their HIV positive status and not by their other attributes such as their race or nationality or occupation.

Jones, on the other hand, established the 'dimensions of stigma'. Dimensions such as: degree of disruptiveness, aesthetic qualities, degree of danger held for others, concealability, cause and origin. The dimensions determine the extent of stigmatizing attitudes and stigmatizing behavior (72).

Link and Phelan exposed the complexities of defining stigma (11) and revealed noticeable polarization between 'social control' and 'blaming models of stigma' (105). Social control means a dominating control by a society which may lead to performance of activities by an individual to fulfill the society's need than the individual's own need (86). The 'blaming model of stigma' opens a political domain to the concept of stigma. The political domain is a sense of immunity from peril that is created by separating "us" (normal individual or group) from "them" (abnormal individual or group with discounted attribute(s) (86). Link and Phelan proposed that the elements of prejudice[2], stereotyping[3], labeling[4] and discrimination[5] occur

[2] 'Prejudice' is defined as a negative attitude towards an individual or a group (Lippmann 1922 in Nelson 2009).

[3] There are numerous definitions of 'stereotypes' in the literature, which most of them refer to stereotype as knowledge structures which are cognitive in nature (106,107) or fixed impressions serve as mental pictures of the social groups or of individual members of those

together, when stigma is allowed to exist (11). They suggested when discrimination or 'enacted stigma' happens the stigmatization is eventually executed. However Deacon believed that the behavior (discriminatory practice) and an intra-psychic phenomenon (stigmatizing attitudes) are not well separated in Link and Phelan's definition of stigma (105). She proposed that a stigmatizing attitude will not be necessarily translated in enactment of stigma (105). Stigma is an argumentative topic and disagreements on different aspects of the concept exist (74,86,102) but it is agreed that stigma is a social process representing a language of relationship and should not be studied merely as an individual attribute(8).

Symbolic beliefs are reflection of one's individual identity and values, and are less rooted in reality (109). Symbolic beliefs play a significant part in the process of stigmatization (110). Symbolic attitudes derive from symbolic beliefs and are part of deep-seated [and well-established] ideologies that might not be realistic (111). For example, homophobia – a symbolic attitude – is the outcome of a symbolic belief that human beings should be attracted to an opposite sex only, and any other forms of

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groups. In short stereotypes are the traits which come to mind when one thinks about such groups (Nelson 2009).

[4]'Labeling' is defined as the act of making an individual "deviant" because certain descriptions, i.e. homosexual, criminal etc., are attached to that individual's behavior (Giddens 2006) (108).

[5] The original meaning of 'discriminate' was to note differences (Nelson 2009). In the social context discrimination refers to activities (attitudinal and behavioral) that deny an individual or a group from resources which can be obtained by others (Giddens 2006, Nelson 2009).

The concept of 'discrimination' is a vast topic and a comprehensive review on it is beyond the scope of this research.

sexuality, for example, being attracted to the same sex is unnatural and should be condemned (112). Symbolic beliefs may determine the fear of being in contact with HIV positive individuals (110). In general, instrumental (fear of contagion) and symbolic (tabooed homosexuality) components of stigma both implicate the importance of instrumental and symbolic peril in relation to HIV/AIDS (110).

2.3 Theoretical and conceptual framework

The purpose of this part of the thesis is to elaborate on the use of different theories in order to explain the bifurcation of social attitude related to HIV/AIDS amongst the [future] health professionals as they become *more* professionalized. That is to introduce a conceptual framework that could explain why as healthcare students became more professionalized their HIV/AIDS-related stigmatizing attitudes diverge across two domains i.e., personal domain vs. professional domain.

In the beginning, this conceptual framework will look at the profession, professionalism and professional development from both social and psychological perspectives, but before that it is necessary to briefly introduce a few theories on *"learning"* as the building blocks of this discussion. Recall that stigma is the process of devaluation of a group of people on the basis of their moral abhorrence (68). To stigmatize someone for their perceived moral taint, the stigmatizer, first, *learns* what is an evil character; and also learns to devalue those who have such evil characters. That's why we have looked at different theories of learning in order to construct our theoretical and conceptual framework on stigmatization.

Afterwards we will explain the bifurcation of attitudes – the change in certain attitudes under the influence of certain circumstances/environments while

some other attitudes remain unchanged. This will be done by confronting the theories that were adumbrated in earlier parts of this discussion.

According to Bandura's *"Social Learning Theory"* individual(s), small groups and large groups learn within a social context under the influence of social *forces*.(113,114) The courses of learning are by a) observation; and b) setting role model(s) (113). The social forces are the outer drivers like the learnt cultural and religious concepts and the inner drivers, which are the personal repercussions of the processed and analyzed outer drivers. Although this theory has undergone changes over the years, (115) these changes do not affect the application of the principles of the *Theory* to the concepts presented in this section of the thesis; and discussing these changes are beyond the scope of this write up.

As learning is the act of acquiring knowledge and skills (116) ;and cognition and analysis are integral to it. Hence, it seems appropriate to briefly mention about Hammond's *"Cognitive Continuum Theory"*, Festinger's *"Cognitive Dissonance Theory"*, and Kolb's *"Experiential Learning Theory"*.

"Cognitive Continuum Theory" describes the modes of cognition while completing a task; whereby cognition is placed on a continuum from intuition at one end to the analysis at the other end (117,118). The ramification of the "*Cognitive Continuum Theory"* is evident in different fields such as information technology (119), sociology,(120) and the health field (121–126). From a psychological point of view, there is no universal agreement on the definition of "*intuition"* and most of the effort to explain intuition has been centered on what is not intuition rather than defining it (127,128). Nonetheless, intuition (hereinafter) is referred to as an *"unjustified and immediate cognition with high confidence in the outcome"*(128).

For example, the moral cognition of an individual who stigmatizes an HIV positive individual because they condemn homosexuality, is based on intuition rather than the analysis. The stigmatizer might have learnt and accepted that homosexuality is an evil character without necessarily analyzing the facts (psychological and/or clinical) about the homosexuality.

According to Festinger's *"Cognitive Dissonance Theory"* the learning outcomes i.e., the beliefs and the attitudes can be changed in order to mitigate discomforts arising from conflicting attitudes or beliefs (129–131). This change is indeed a cognitive strategy within the *self* to adapt a preference, which by default will reduce the disharmony or dissonance between the old – deeply seated – attitudes and the new contradictory ones (132). I, for example, would stigmatize an HIV positive individual, because I believe that homosexuality is a sin based on my religious upbringing. As a healthcare student, however, I may not have the same belief, because I have *learned* about the psychological and clinical aspects of homosexuality and my professional duties as a care provider. Hence, disharmony may arise as a result of conflict between my professional attitudes and deeply-seated personal attitudes. To reduce the disharmony of the conflicting attitudes, I might have my personal beliefs changed to make them similar to my professional beliefs.

According to Kolb's *"Experiential Learning Theory"* or learning on-the-job both personal and professional experience (in a work environment) have roles in shaping learning (133). The learning starts with observation and reflection that eventually may lead to the formation of abstract concepts or attitudes. These concepts or attitudes are then tested in virtual or actual environments such as a health working environment. Eventually the outcome of such exposures are the specific

experiences that either are complementary or otherwise conflicting to the prior attitudes and concepts (134). For example, academics, practitioners, senior colleagues, peers, and role models may, through observed actions or off-the-cuff remarks, either support or condemn the explicit messages about professional development in a working environment. The latter could have detrimental effects on the values learnt by the healthcare students. If a practitioner passes a demeaning comment about healthcare professionals/AIDS patient in a healthcare setting in front of a housemen officer, that housemen officer may pick up the same behavior to stigmatize their HIV/AIDS patients.

Learning is *"environment-specific"* and starts at home and is extended to different virtual/ actual environments at different levels i.e., classrooms, parks, parties, online chatting rooms, colleges, universities, actual working environments such as banks or hospitals. Eventually, via observation and cognition, one subsequently learns to hold an attitude, which could be either expressed – to mark a behavior – or remain unrevealed. For example, a nursing student has learned in the classroom to provide equitable care to *all* of their patients. However, as a nurse she observes her colleague who shows stigmatizing attitudes towards HIV/AIDS patients in the healthcare setting. If the nurse decides to hold stigmatizing attitudes towards PLWHA, she has the choice to either show stigmatizing behavior or not to reveal her stigmatizing attitudes.

As our theoretical and conceptual framework is about the [future] health professionals, it seems appropriate to introduce the theory of *"Profession"* and subsequently relate it to the concept of *"Professional development"* here. In broad term, we have referred to professions and professionals and eventually we have

focused on health professions and health professionals to draw attention to the professional development and stigmatizing attitudes of healthcare professionals.

The lack of theoretical foundation and the dearth of theoretical framework to specifically describe the *"professions"* is a challenge for the research agenda and the researchers (38,61). Nonetheless, with reference to the *"theory of professions"* by Savage (38), the theoretical and conceptual framework of this thesis is further explained in the coming paragraphs. Although there is no general agreement on the definition amongst sociologists (61,135), some define the profession as "A network of strategic alliances across ownership boundaries among practitioners who share a core competence." (121); and others define it as "An occupation based on specialized training for the purpose of rendering ethical and specialized service(s) for a fee"(37,61,62). According to Eliot Friedson, in the most elementary sense, profession is a set of institutions which permit the members of an occupation to make a living while controlling their own work (37). As matter of fact the professions are institutions that have evolved to be indispensable functional parts of our society and it is through them that the social progress is achieved (63,136).

The sociological literature focuses on professions as "social groups" (38); where, profession[6] is defined as a vocation combining [tacit] knowledge[7] and skills (expertise) to provide a service to individuals and society (38,45). Subsequently, in the same context, the professionals are those who play a defined role in the society;

[6] 'Profession' means "speaking forth." Public affirmation of values has been a distinguishing attribute of a profession from a long time (Wynia 1999) (176).

[7] In the vocabulary of the philosophy of science, "tacit" knowledge is the esoteric or secret knowledge;(61) that is complicated and serves to solve the unpredictable or non-routinized problems that may arise during the course of rendering the professional duties.

and this role is a reflection of an interplay between the social groups and the economic systems (38).

There has been substantial theoretical work conducted on the "Professions": how they came into being, their nature, and their maintenance. Embedded within this literature are empirical and theoretical studies on *professional development* or how a person joins the ranks of a profession (38,61–63).

Theoretical work on the professions in economics has tended to focus on the monetary drivers (62). Milton Friedman's classic *Capitalism and Freedom*, for example, has a chapter devoted to the medical profession, the economic rationale for its existence, and the economic rationale for its maintenance (137). Theoretical work on the professions in sociology acknowledges the wealth characteristics of professions but has looked more broadly at the social role of the professions. Weber and Parsons are probably the gurus of the area (138). Most sociological works on professions highlight, in addition to the economic aspects, issues of Ethics, Standards and Conduct (139).

Dingwall, writing about professional mediators, discussed the nature of the profession in terms that could be easily translated into healthcare. Becoming a professional was associated with an "accredited practitioner offering a standard package of interventions to *all* clients", and a concern with the protection of title, ethics and quality of practice, and job boundaries (139).

Success of a profession is in the hands of its professionals, the executors of power, (61) on how they decided to utilize the standard package of interventions at their disposal (routines). No professional would be able to learn and perform all of the routines of a profession; as the competence and capabilities are limited in each professional. (38) Moreover, certain routines – services – in a profession are more

developed and gain more importance; hence, acquiring them i.e., learning ability and adaptability, becomes a necessity for the professionals of that profession in order to render those routines competitively to their clients (38).

A professional, however, is not simply brought into being. They are developed over time, as they gradually learn the skills of the profession. Their development should be observable. That is a year five medical student should possess more clinical knowledge and should demonstrate better clinical skills compared with a year one medical student. Moreover, when a student starts, per se, healthcare professional course, they would not be steeped in the ideas of the profession described above. By the time they have finished their university training, they may not be a fully-fledged professional, but they will, we would anticipate, be *more* professional compared with a student who has just begun the first year of their healthcare professional course.

Subsequently, senior professionals – because of their [tacit] knowledge[8] – can teach the junior professionals about their profession. Experience professionals often depict a *self-reflective*[9] capacity on their intuitive knowledge and use this capacity to cope with uncertainties, non-routinized and conflicting situations of practice (63).

Ostensibly, an implicit process of selection amongst the routines is imposed by the profession on the professionals that subsequently requires a gradual enactment

[8] In the vocabulary of philosophy of science, "tacit" knowledge is the esoteric or secret knowledge;(61) that is complicated and serves to solve the unpredictable or non-routinized problems that may arise during the course of rendering the professional duties. In psychology, tacit knowledge refers to the knowledge that is hidden from the person himself/ herself.

[9] This is called the "*reflective practitioner theory"* and failure of such self-reflect has been translated into the well-publicized scandals of highly regarded professionals who have abused their power –autonomy- for personal gain.

of *certain* attitudes[10] and capabilities in the professionals to learn, re-learn, and adapt those *selected* routines (61).

From an economic point of view these are the [tacit] knowledge, routines, and capabilities that transform the professional competences into success i.e., economic profitability(38). Hence, the profession would demand from its professionals to select, improve, and prioritize the knowledge, the routines, and the capabilities which eventually translate into more success.

Here it becomes evident that a strategy of selectivity and adaptability according to the society's need –which undoubtedly has economic meanings to it-, overrules the very basic strategy of being professional i.e., applying, implementing, and operationalizing all of the learned routines during the course of professional development.

From a global view professionals may change their professional behavior due to the demands by the a) profession; b) the peers; c) the clients; and d) the training; and e) self. In order to change a behavior, one may argue that, an attitude needs to be formed or reformed (140). The change in attitude could be linked to the "learning theory"; where one could learn by a) observation, and b) setting role models.

Moreover, as per processes involved in a course of professional development, the apprenticed professionals pass specified selection points. At each point they gradually receive a complementary set of routines (38). Each phase of professionalization emphasized different competencies and eventually minimum

[10] This phenomenon could be explained by Brante's "*closure theory*" in which the societies, groups, professions, and affiliations all strive to monopolize the sectors of the market for profitability (61).

essential routines that produce a qualified professional are chosen and adapted by the trainees (38). Although it is suggested that the professional procedures and trainings should not be too routinized and predictable (61), most of the professional development courses are structured and routinized and their outcomes are expected to be predictable.

As full-fledged professionals, they are free to choose their own jurisdictions – applied autonomy – to justify their decisions and actions while performing their professional roles and responsibilities (38). Furthermore, no one owns the right to challenge their decision or to speak on behalf of the profession except their peers. This right is what is referred to as "autonomy" (38,61). The professionals need only to justify the use of their authority in their decision to their peers (141).

Ideally the justification in clinical decision making should meet two criteria: a) their *competence* i.e., [tacit] knowledge and b) their *morality* based on the professional code of conducts and ethics (141). Now, the branching of the social attitudes of *healthcare students* could be explained by looking at the profession from a social point of view and observing professionalization from a psychological point of view in the *learning* context.

Education can be characterized as a process of *"norm acquisition"* in relation to morality (142,143). As one learns more about the norms of health profession – code of ethics and professional conducts – and continually tries to justify the moral values of the new norms; eventually a disharmony may be created. This phenomenon has striking structural and conceptual similarities with the social learning theory. The individual has acquired attitudes in two different environments and in two different

time periods. At first learning from the family members in small groups and later on learning from the health professionals in a [virtual or actual] healthcare environment.

Culturally-sanctioned and approved attitudes learned earlier might confront the newly learnt attitudes –health ethics and professional code of conducts. For instance, one may hold negative attitudes towards PLWHA as the stigmatized members of the society, but one has learnt –acquired new norms i.e., traits of professionalism- to be blind to that specific group of people if they become one's patients in a clinical setting.

The idea of a standard package of interventions available to all clients, and the centrality of ethics and quality of practice are particularly pertinent to disease related stigma in a healthcare setting. If enacted stigma (discrimination) results in different packages of care being offered to one group (unrelated to the healthcare needs of that group), then concerns necessarily arise about the ethics of practice and the quality of that practice. In other words, it raises questions about the very nature of being a professional.

When encumbering feelings arise out of the professional role, the attitudes might be periodically jettisoned –as part of professional decision making- by the individual to combat dissonance between the professional and the personal attitudes.

Moreover, if an enacted attitude is consistent with one's self-concept and self-respect; then one becomes more inspirational and creative in rationalizing it (62). Hence the healthcare professionals justification to discriminatory attitudes or behavior towards patients centers around their morality (144). Health professionals have argued that they should not be forced to render their professional services if they conflict with deeply held morals or religious beliefs (144). The cognitive

continuum theory seems to be helpful in further explaining the split in the professionals' social attitudes.

As mentioned earlier cognition considerably affects the depths and expectancy of learning [re-learning]. It could be suggested that the divergence in the professionals' attitudes is the aftermath of a mental juggling between a less challenging – a more intuitive – personal norms and a more challenging – a more analysis-driven reasoning – professional norms.

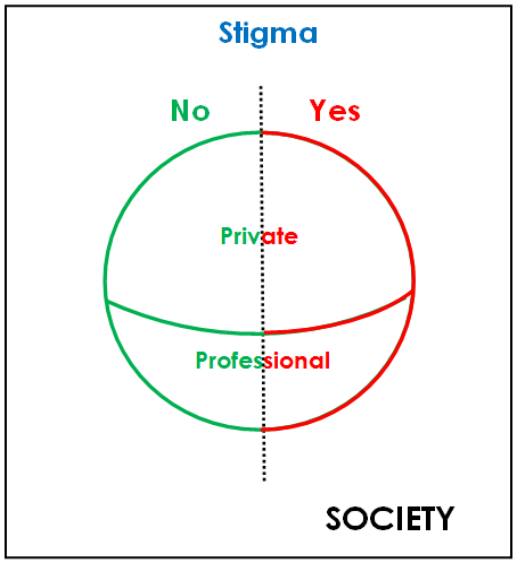
In one of his interviews Milton Friedman says: "*If you're going to try to change things, you have to recognize that it's going to take some effort and there is going to be some sharp criticism"*(145). Indeed may be the fear from that sharp [self]-criticism is another contributing factor to the enactment of discriminatory attitudes.

2.4 Bifurcation of social attitude

The idea of bifurcation of social attitude in the context of acceptance of a role and delivering it responsibly, in a health context, is well argued and discussed (35). The pandemic of HIV should be looked at as a population problem when it comes to prophylaxis and treatment strategies (35,146).

To elaborate the idea of "professionalization of stigma", we have tried to demonstrate the proposed theory with the help of the following figure:

Figure 1: Bifurcation of HIV/AIDS-related stigmatizing attitude



Stigma can exist in two different domains. A "stigmatizer" i.e. the one who stigmatizes can express their stigmatizing attitude and/or behavior in hypothetically four different ways.

We have hypothesized four possibilities in the context of personal and professional stigma.

These four possibilities are as follows:

1- Stigma exists personally as well as in the context of one's profession. For example, a doctor who personally believes PLWHA deserves what they have got and also deprives their patient's access to care while working in the hospital.

2- Personal stigma does not exist, however, such stigmatizing attitude does exist in the context of professional prospect. This type of stigmatizing behavior is not our primary concern and will not be investigated in this PhD project.

3- Personal stigma does exist but it does not exist professionally.

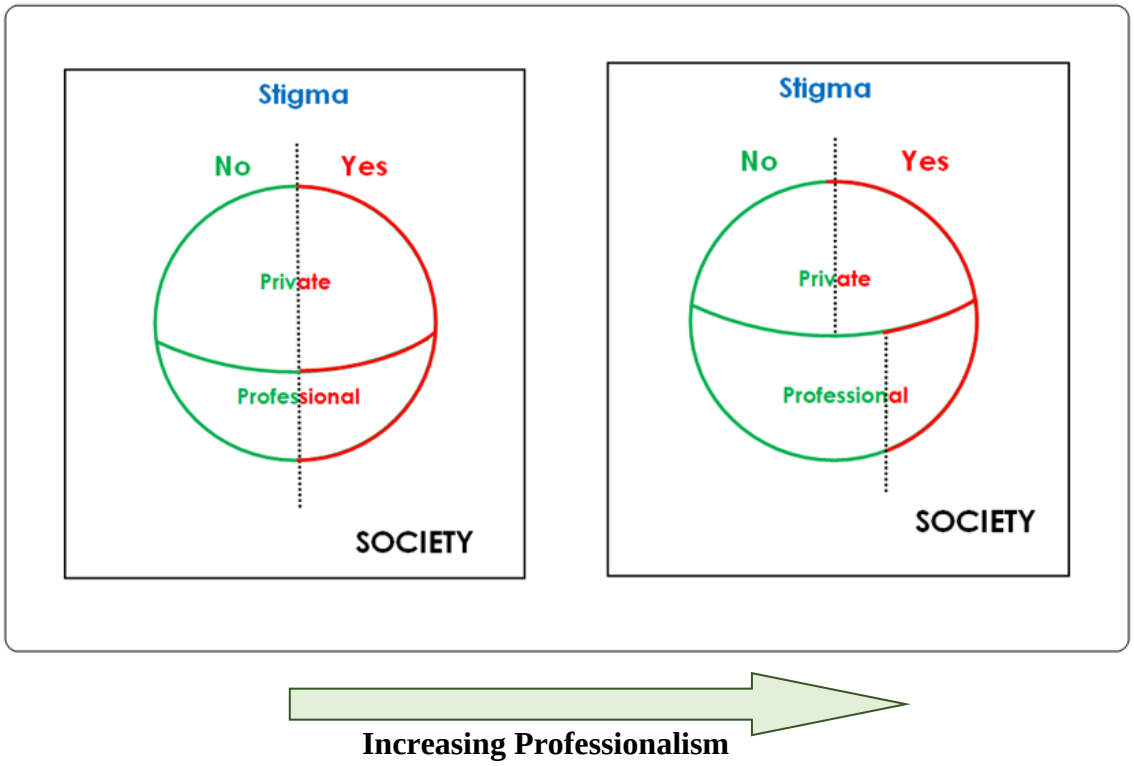
This type of stigmatizing behavior is of interest to us and it will be investigated in this research.

4- When private and professional stigma do not exist. This condition is considered to be an ideal situation, where one decides not stigmatize at all.

In brief stigma is a process of differentiation and professionalism teaches the professionals to avoid differentiating their patients based on ethnicity, religion, race, sexual orientation, while providing care in the context of their profession.

The professionalization of a stigmatizing behavior in a specific context i.e. the profession and execution of professional duties and responsibilities is illustrated in Figure 2. As professionalization increases the stigmatizing attitudes and/or behavior of the stigmatizer decrease while dealing with the stigmatized person if the context is a professional one, but the private and personal stigmatizing attitudes and/or behavior may not decrease necessarily.

Figure 2: Professionalization of stigma



2.5 Stigma of the disease(s)/ HIV/AIDS-related Stigma

The tendency to view HIV/AIDS as something which happens to other people, and particularly to people who are 'different' either in their behavior or their sexual orientation (103,147) , has made HIV/AIDS a highly stigmatized condition (3–14,147).

HIV/AIDS is not a singular entity (26,79). It is linked to longstanding stigmas of sexual misconduct and, in some communities, illicit drug use. (148). The interactions of co-stigmas i.e. unaccepted sexual behavior, illicit drug use and disease stigmas and the socio-cultural meanings associated with stigmatized characteristics, impact on the overall stigma experienced by PLWHA (26).

Beliefs, attitude and behavior towards PLWHA do not occur in a cultural vacuum (149). Society serves as a medium where we learn about all these by interacting with our peers, through conversations at work or at home (149).

People with HIV have been divorced, thrown out of their homes and driven from their villages, lost their jobs (5) even their family members have been attacked verbally and/or physically (71); all because of that discrediting attribute. Inclusion of family members and care-takers in the circle of HIV/AIDS stigmatization victims (6) confirms that stigma is a not a response to an attribute but a complicated societal retort.

People with HIV have also been denied access to treatment and care by health professionals for the same reason (15). Even with the advent of antiretroviral therapies, which do not cure HIV, but do manage the progression of the disease to AIDS, the HIV/AIDS continues to carry with it a significant social sigma(19–23).

The World Health Organization (WHO) has predicted a positive social change towards HIV/AIDS stigma if the preventive and curative modalities are made available (150). This optimistic prediction can be challenged because HIV/AIDS stigma is not about the incurable nature of the disease only, but about the perceived deviations from societal norms. Availability of cure may not eliminate the multi-layered HIV/AIDS stigma (5,26,110). Though it is claimed to be unidimensional (79), nevertheless, the HIV/AIDS stigma is a multidimensional and multi-layered concept; and is a social-psychological process (8,36,79,151).

When talking about HIV/AIDS-related stigma, one could equally well consider stigmas associated with other diseases such as mental illness(25), cholera(152), tuberculosis(153,154), hepatitis C (155), filariasis(156), long-term ailments(69) , epilepsy(157,158), leprosy(159), syphilis(160), eating disorders and anorexia (103) etc. Although the etiology and pathophysiology of the diseases are all different, there is a communal similarity i.e. these all have a lay-social stigma, but are generally approached professionally in healthcare settings(161–163).

2.5.1 HIV/AIDS-related stigma amongst healthcare providers

Does prejudice lead to stigma? Or does stigmatization lead to prejudicial thoughts and behavior? Or are they two-sides of the same coin? (83) Or can stigmatization cause social inequality (164). This perceived inequality has generated a substantial amount of research on stigma and its related issues in different fields specially the health fields (164).

One of the critical factors affecting the uptake and maintenance of an antiretroviral regimen is HIV positive person's utilization of a functioning healthcare system, with one of the most significant impediments to utilization being the attitude of healthcare professionals within the services towards people living with HIV/AIDS

(PLWHA) (73,96,165–168). It has been established that HIV-related stigma in healthcare settings interferes with the optimal utilization of health services, (11,17,18,165–167,169,170) and it is also well understood that lack of access to the prevention services of the healthcare system has been an obstacle to control the pandemic of HIV/AIDS (171). We also acknowledge that amongst other barriers to health utilization, are the barriers at personal level, community level and organizational level (172).

Surveys of health workers have shown that about 10% - 20% hold negative attitudes towards people living with HIV/AIDS. Such attitudes are associated with both fear of transmission and fear or disapproval of the actual or imagined lifestyles of people living with HIV/AIDS (148). Stigmatizing behaviors, for example, has been reported from surveys conducted with healthcare providers, where HIV/AIDS was generally assumed to be a punishment resulting from bad behavior (17,18,173). HIV/AIDS stigma is also associated with delayed care seeking behavior of PLWHA (174).

More recently in the area of healthcare, however, there is some evidence to suggest that professionals do not stigmatize people with HIV to the same degree as the professionals in early days of the epidemic, and do provide appropriate access to treatment and care (175). The infection pathways are well understood, and can be easily managed (even following needle stick injuries), which means that professionals may feel safer today treating people with HIV than in the early days of the epidemic (175).

Proof that a reduction in discriminatory attitudes and behavior in the health services is possible comes from both anecdotal and empirical evidence, (148) which

indirectly can lead us towards the design of more effective intervention tools so as to reduce the stigmatizing attitudes and behaviors personally as well as professionally (17,164).

Furthermore, the growing professionalization of the healthcare workforce, particularly in terms of ethical practice and appropriate professional behavior – professionalism – has supported the management of disease related stigma in a professional setting (30,31).

In the most elementary sense, 'professionalism'[11] is a set of norms which permit the members of an occupation i.e., social group, to make a living via economical support system, while controlling their own work (37,38). Nonetheless, theses definitions and concepts are not without their own limitations (38); and a full discussion is beyond the scope of this write-up and is ,somehow, least relevant to the contents of this thesis. The point to bear in mind, however, is that professionalism is entangled with the societal interactions between the member of the profession and the members of the society.

There are numerous ways of expressing the concept of professionalism. For example; professionalism includes assuming responsibility, demonstrating a commitment to excellence, peer respect, displaying honesty and integrity, and demonstrating care and compassion (27). Or professionalism as a concept is

[11] 'Professionalism' as a 'set of attitudes and behaviors believed to be appropriate to mark a collection of individuals with a calling [vocation] (Merriam-Webster Dictionary in (Gaiser 2009) (40).

Economists and medical ethicists recognize professionalism as an 'essential mediating force in patient care'.(39)

(Hammer 2000)(65) defined professionalism as 'the active demonstration of the traits of a professional'.

amalgamation of morality and honesty resulting in the betterment of performance (44).

In the medical context professionalism has been defined without necessarily reaching agreement (45),nevertheless, these definitions are congruent where the concept of professionalism can be operationalized in the context of a societal expectation and social contract between the health professionals and the patients(28,46–51).

Van Mook defined ‘medical professionalism’[12] by exploration of Smith’s notion. Smith defined ‘medical professionalism’, by the essentials qualities of a physician: 1- embrace being a physicians, 2- caring and altruistic, 3- honesty, 4- integrity, 5- team player, 6- strive for excellence, 7- accept the duty of serving patients and society, 8- courage and heroism regardless of working hours (27). Van Mook designated ‘expertise’, ‘ethics’ and ‘service’ as three pillars of the concept of medical professionalism,(45)without which medical professionalism would subside. Van Mook’s definition would be used to attend to professionalization in the healthcare profession in this research.

A failure of adherence to the ethics of medical service leads to self-protective behavior or lack of altruism for instance, in the difficulties in the management of AIDS epidemic. (176)

[12] In the 1980s, a project to evaluate the humanistic characteristics in the internist was initiated by the American Board of Internal Medicine (ABIM). As a result of the initiative “humanism” was defined in terms of “respect”, “compassion” and “integrity”. Subsequently in the 1990s the study named “Project Professionalism”, was started, which included the additional values of “altruism”, “accountability”, “duty”, “excellence”, “honor”, “integrity” and “respect for others” in the definition of professionalism.(45)

2.6 Problem statement

Although HIV/AIDS-related stigma in the health services has been studied, little work has attended to the relationship between professional development, and stigmatizing attitudes. Indeed, most research has relied on cross-sectional data from single pool of participants in order to assess levels of stigma at a single point in time within one group, without attempting to understand how stigmatizing attitudes may develop and change over time. This question is particularly crucial within the context of health service provision, because of the potential link between the trajectory of stigmatizing attitudes and the trajectory of professional development.

The proposed PhD research will extend earlier research by examining the relationship between the stage of professional development and the kinds of stigmatizing attitudes held about people living with HIV/AIDS.

2.7 Aims and objectives

The primary objective of this study is to investigate the relationship between the stage of professional development of healthcare students and the kinds of stigmatizing attitudes held about people living with HIV/AIDS. More specifically, we aim at measuring the attitudes of students towards PLWHA to assess (a) the level of stigmatizing attitudes, and (b) differences between attitudes in professional and private domains. The conditional secondary objective is to develop a suitable tool to measure the stigmatizing attitudes in professional and private domains.

2.8 Hypotheses

The specific research hypotheses are outlined below. The written formality of the hypotheses may obfuscate the intent. A diagram (Figure 3) is included, and by

reference to the diagram, the hypotheses should be clear. The diagram shows two dashed lines with negative slope, but different gradients. The topmost line represents evaluations of disease in a private/social situation, and the bottommost line represents disease in healthcare situation.

1. Healthcare students will demonstrate significant levels of disease related stigma. Although not specifically marked in the diagram, this is tested by looking at the difference between the weighted average of $\mu 1$ and $\mu 2$.
H1: The mean difference in disease related stigma between the personal and professional domain is significantly greater than 0

2. The levels of disease related stigma among healthcare students will decrease significantly with increasing levels of professionalization. Although not specifically marked in in the diagram, this is tested by looking at the weighted average slope of β 1 and β 2.

H1: The average slope of $\beta 1$ and $\beta 2$ is significantly less than 0.

3. On average, healthcare students will evaluate disease in healthcare situation in a less stigmatizing fashion than disease in social/private situation. This is shown by difference between $\mu 1$ and $\mu 2$.

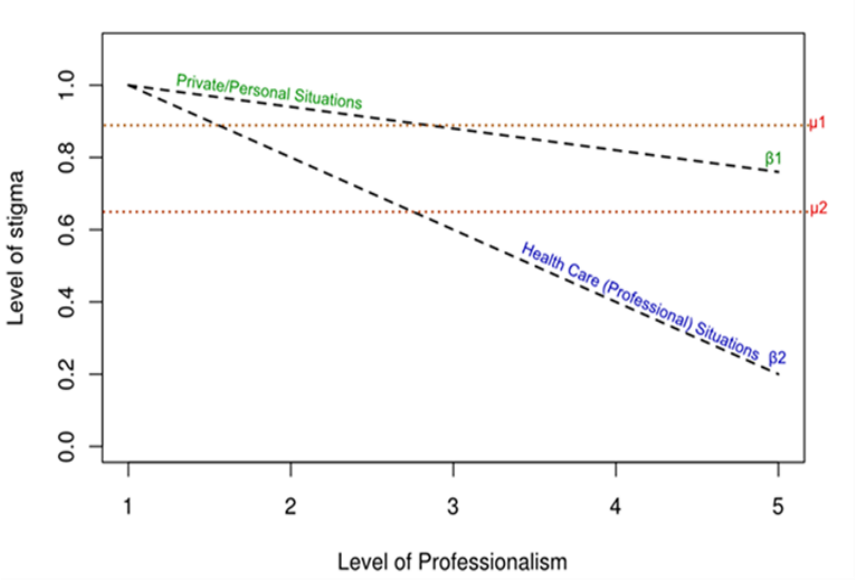
H1: $\mu 1 > \mu 2$

4. The rate of decreasing disease related stigma associated with increasing levels of professionalization will be greater for evaluations of disease in healthcare situations than for evaluations of disease in social/private

situations. This is shown by a steeper gradient for β2 than β1.

H1: $\beta 2 > \beta 1$

Figure 3: Schematic presentation of the hypotheses



METHODOLOGY

3.1 Introduction

In the previous chapter we proposed a conceptual and theoretical framework that hypothesized the bifurcation of social attitude.

This chapter consists of three sections. Part I contains a protocol that explains the mechanics of examining the hypotheses derived from the conceptual and theoretical framework. Details of the study population, study design are embedded in the protocol. Part II, explains the data collection, the procedures and analyzing techniques involved in the development and validation of the study measurement tools (one tool measuring *personal* domain of HIV/AIDS-related stigma and the other one measuring *professional* domain). Finally, the chapter ends –in Part III – with the description of a suitable modeling technique that could explain the findings.

3.1.1 Declaration for Thesis Chapter [Methodology – Part I]

Declaration for Thesis Chapter [Methodology – Part I]

Monash University

Declaration by candidate

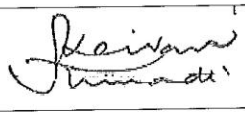
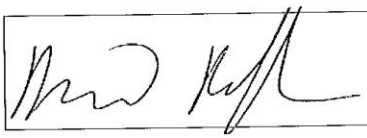
In the case of Chapter [Methodology], the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Keivan Ahmadi (KA) developed the concept and made substantial intellectual contribution to the manuscript. KA gave the final approval to the publication of the manuscript.	80

The following co-authors contributed to the work. Co-authors who are students at Monash University must also indicate the extent of their contribution in percentage terms:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Professor Dr. Daniel D Reidpath	Reshaped the developed concept and made substantial intellectual contribution to the manuscript. Gave final approval for the publication of the manuscript.	
Professor Dr. Pascale Allotey	Revised the manuscript critically and improved the presentation of the ideas. Gave final approval for the publication of the manuscript.	
Professor Dr. Mohamed Azmi Ahmad Hassali	Revised the manuscript critically and improved the presentation of the ideas. Gave final approval to the publication of the manuscript.	

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work*.

Candidate's Signature		**Date** 22-04-2015
Main Supervisor's Signature		**Date** 15 May 2015

*Note: Where the responsible author is not the candidate's main supervisor, the main supervisor should consult with the responsible author to agree on the respective contributions of the authors.

3.1.2 Protocol paper

The following protocol paper describes the rationale, methods and proposed analytical techniques to examine our hypotheses. The paper outlines the methods for developing a measurement tool to measuring bifurcation of HIV/AIDS-related stigmatizing attitudes of healthcare students. That is the professional HIV/AIDS-related stigmatizing attitudes in relation to professional development; and personal HIV/AIDS-related stigmatizing attitudes that are unrelated to practice.

BMJ open
accessible medical research

Professionalisation and social attitudes: a protocol for measuring changes in HIV/AIDS-related stigma among healthcare students

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ABSTRACT

Introduction: HIV/AIDS-related stigma affects the access and utilisation of health services. Although HIV/AIDS-related stigma in the health services has been studied, little work has attended to the relationship between professional development and stigmatising attitudes. Hence, in this study, we will extend earlier research by examining the relationship between the stage of professional development and the kinds of stigmatising attitudes held about people living with HIV/AIDS.

Methods and analysis: A serial cross-sectional design will be combined with a two-point in time longitudinal design to measure the levels of stigma among healthcare students from each year of undergraduate and graduate courses in Malaysia and Australia. In the absence of suitable measures, we will carry out a sequential mixed methods design to develop such a tool. The questionnaire data will be analysed using mixed effects linear models to manage the repeated measures.

Ethics and dissemination: We have received ethical approval from the Monash MBBS executive committee as well as the Monash University Human Research Ethics Committee. We will keep the data in a locked filing cabinet in the Monash University (Sunway campus) premises for 5 years, after which the information will be shredded and disposed of in secure bins, and digital recordings will be erased in accordance with Monash University's regulations. Only the principal investigator and the researcher will have access to the filing cabinet. We aim to present and publish the results of this study in national and international conferences and peer-reviewed journals, respectively.

ARTICLE SUMMARY

Article focus

- The primary objective of this research is to examine the relationship between professionalisation and stigmatising attitude towards people living with HIV/AIDS among healthcare students.
- The secondary aim of this study is to investigate the availability of suitable measurement tool(s)—otherwise to create a scale to measure the transformation of HIV/AIDS-related stigma in the context of the health professionals' work environment.

Key messages

- A fair and responsive health system requires a healthcare workforce that is blind to the 'undeserving' and the 'morally reprehensible'; hence, studying the professional development in relation to the stigmatising attitude development is of great importance in addressing the inequalities in the delivery of care.

Strengths and limitations of this study

- The major strength of this protocol is its design which will allow us to study the professional development and possible change(s) in attitudes over a time period.
- The limitation of this study is the uncertainties pertaining to the sample size calculation as well as the fact that we may measure a self-reported attitude rather than an actual attitude. The sampling limitations imposed by ethical requirements also raise issues about a selection bias. While the possibility of the bias needs to be acknowledged, the nature of the research question probably limits the bias.

INTRODUCTION

A healthcare workforce that is responsive and fair in its treatment of patients is one of the central pillars of a modern health system.[1] It is for this reason, among others, that healthcare workers are bound by ethical codes of practice to treat patients according to their need, and not according to their gender, religious beliefs, sexual orientation, skin colour or other socially (de)valued attributes.[2] Possible exceptions to this rule of social blindness arise when those otherwise ignorable social attributes may affect the

diagnosis, prognosis or choice of the most effective treatment.

What should happen, however, when the patient is perceived as a complete reprobate—a repugnant individual whose very presence challenges the healthcare worker's moral foundation? In theory, the answer is simple—treat the patient in front of you according to their healthcare need.

The challenge for the health system is that practice does not necessarily mirror professional intent, and personal prejudices and fear of contagion interfere in decisions for care.[3–5] The literature is replete with examples of patients who are accorded different (worse) treatment because of some perceived moral taints.[6] The HIV epidemic provides a classic case in point. Healthcare workers have reported not wanting to treat people living with HIV/AIDS (PLWHA) for a range of reasons, including: because the patient was undeserving, or because treating PLWHA would devalue the healthcare worker in the eyes of others.[7] This situation has, in many instances, created a tiered health system in which 'deserving' patients have received treatment and the 'undeserving' have not.[6] High levels of stigma and discrimination are associated with a reduction in access to treatment and care for those with undesirable attributes.[8]

To overcome the dangers of discrimination associated with the social valuation of HIV/AIDS patients, many teaching programmes now contain explicit or integrated learning objectives that relate to professionalisation.[9] The process of professionalisation fosters the inculcation of acceptable practice of healthcare workers in line with societal expectations, and the social contract between the client and the healthcare worker.[10–12] In this context, increasing the professionalism of the healthcare workforce is as much about improved technical competency as it is about ethics of practice. Increasing professionalisation is thus expected to result in less stigma and discrimination in healthcare settings.[13]

Whether professionalisation does protect patients against the creation of tiered healthcare is an empirical question, but there is reason to believe that it would work by reducing negative attitudes and discriminatory behaviour towards patients—particularly those from socially marginalised groups, such as HIV/AIDS patients. There is already some evidence in the literature to support this idea.[14 15] For instance, it is known that targeted learning focused on attitudes to specific marginalised groups can result in a positive attitudinal change.[16] What is less clear is whether a generic focus on professionalisation not focused specifically on one disease or another is sufficient to improve attitudes towards all socially marginalised groups regardless of the socially devalued attribute.

In posing the idea that professionalisation may reduce stigmatising attitudes, two refinements need to be introduced. The first is a distinction between generic professionalisation and targeted learning, because it goes to the heart of ensuring a responsive and fair health system. For instance, in targeted learning, if programmes need to be developed to address stigmatising attitudes of a healthcare workforce to every marginalised group or disease, the cost will be too high and the educational process will always be reactive. By contrast, a generically professional healthcare workforce that understands and follows a holistic approach to the ethical codes of conduct is a more flexible workforce, which is less likely to create a tiered healthcare system.

The second refinement is to draw a distinction between an individual as a healthcare professional and that same individual within a private, non-professional domain. There is no reason to assume that the equanimity possessed in the professional domain towards socially marginalised people will translate into the private life of health professionals. Furthermore, there is no overwhelming reason to believe that it would be appropriate for professional attitudes to be always concordant with private attitudes, and earlier investigations of social attitudes among (future) healthcare professionals have clearly depicted discordant attitudes in personal and professional domains[17] For example, I may be 'blind' to the fact that a person is a paedophile for the purposes of treating their myocardial infarction, but my vision might be restored if there is some indication that they are joining my social circle.

One might anticipate, therefore, that with increasing professionalisation there will arise a degree of bifurcation in the social attitudes of healthcare workers towards marginalised people. Specifically, while negative attitudes towards the socially marginalised may decrease with increasing professionalisation, for the purposes of providing treatment and care, the same change in attitude may not be observed towards the socially marginalised in the personal domain.

Rationale

Although HIV/AIDS-related stigma in the health services has been studied, little work has attended to the relationship between professional development and changes in stigmatising attitudes. Indeed, most research has relied on cross-sectional data to assess generic levels of stigma,[18–28] without attempting to understand how attitudes may develop and change over time, or differences between stigma associated with the professional and private domains of life. This question is particularly crucial in the context of health service provision, because of the hypothesised link between the trajectory of stigmatising attitudes and the trajectory of professional development.

The primary main objective of this study is to investigate the relationship between the stage of professional development of healthcare students and the kinds of stigmatising attitudes held about PLWHA. More specifically, we aim to measure the attitudes of students towards PLWHA to assess (1) the level of stigmatising attitudes, (2) differences between attitudes in professional and private domains and (3) changes in the differences

between attitudes in professional and private domains as the students become increasingly professionalised.

Although there are a number of measures of stigma, there are few separate measures of stigmatising attitudes in professional and private domains and none validated for use in our research setting. The conditional secondary objective, therefore, is to develop a suitable tool to measure the stigmatising attitudes in professional and private domains. This secondary objective, however is described in less detail and the protocol assumes that such a measure is identifiable.

METHOD AND ANALYSIS

Study design

The ideal design for this research would be a 4-year to 5-year longitudinal study of healthcare students measuring changes in attitude over their professional course; however, an alternative approach is proposed which limits the resource expenditure while providing a good indication of the idea's merit. Instead of a longitudinal design, a serial cross-sectional design (to examine differences between cohorts in different years of study) will be combined with a two-point in time longitudinal design (to examine differences between the beginning and the end of a single year of study; figure 1). Levels of stigma will be measured once at the beginning of a single year of study and once at the end of the same year, and this will be conducted across year cohorts.

Study population

Monash University is an Australian university that has multiple campuses in Australia as well as in Malaysia and South Africa. In this study, we will recruit Monash University healthcare students from three campuses (two campuses in Australia and one campus in Malaysia). Students over the age of 17, studying a 4-year plus, professional, healthcare qualification, degree course will be eligible.

Students with a previous healthcare qualification will be excluded; for example, a nurse returning to university to pursue medicine. Also, students below the age of 17 will be excluded. There are no other exclusion criteria.

Sample size calculation

Usually the number of predictor variables, the variability in the outcome variable, the correlation between the repeated measures, and the type of statistical test planned are used to calculate the minimum number of respondents needed to achieve a significant result with known probability.[29] The variability in the outcome measures is unknown, as is the correlation between the repeated measure of personal and professional stigma, making a realistic sample size calculation almost impossible.[30] However, a recent study of HIV knowledge and stigma in a Malaysian healthcare cohort provides a crude guide.[31] In that study without repeated measures, a sample size of 340 was calculated. Inflating this estimate to account for the repeated measurement, in what amounts to a conservative design effect of 2.5, leads to an estimated sample size of 850. However, the ethical mechanisms operating within the University for the use of students as participants prevent random sampling and one must, in reality, attempt to contact all students.

Data analysis plan

If the assumptions hold, we anticipate the use of mixed effects linear models to examine differences between the level of stigmatising attitudes between year-group cohorts, controlling for appropriate covariates, such as age, sex, ethnographic backgrounds and course.

The approach to the analysis of the data assumes a serial cross-sectional design. It is conceptually simple to think of the data analysis in terms of repeated measures analysis of covariance (ANCOVA) where stigmatising attitudes are the outcome measures measured twice within a person (ie, a measure of personal and professional stigma). The level of professionalism is treated as an ordered factor based on years of study; and sex, level of HIV knowledge, and the type of degree programme are treated as nominal, interval and nominal covariates, respectively.

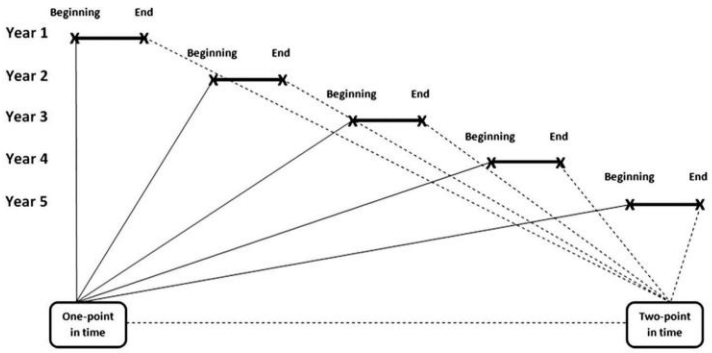

Figure 1 Study design for MBBS programme.

In the preliminary stages, exploratory data analysis will be used to check and describe the data. However, rather than repeated measures of ANCOVA, which was described for its conceptual simplicity, a mixed effects linear model will be fitted to the data to control for repeated measures of stigma within a person. The great advantages of the mixed effects linear model for repeated measures designs is that if one of the outcome measures is missing (eg, if a participant fails to complete the personal stigma scale but does complete the professional stigma scale), the remaining data from the individual can still be retained. The data will be analysed using the R statistical environment.[32]

Measurement tool

There is currently no measurement tool designed to measure stigmatising attitudes in a professional and private domain separately, and this is the secondary objective of the research. We will carry out a sequential mixed methods design to develop a measurement tool (ie, a questionnaire). We will form a group of healthcare specialist(s), health academics and healthcare team members, that is, nurses, medical doctors, pharmacists, etc with at least 5 years of clinical experience, and together we will implement a four-step approach to create the new measurement tool

1. We will define the main facets and domains of the measurement tool based on 'personal domains of stigma' versus 'professional domain of stigma in the context of a health professional's work environment'. We anticipate that this could be achieved by creating brief hypothetical scenarios about HIV positive individuals and HIV negative individuals in health settings. These hypothetical scenarios—vignettes—could be themed to reflect fear of contagion, etc. For example, a scenario in which 'a physician refuses to operate on a patient with HIV/AIDS to protect themselves from contracting HIV/AIDS'.
2. We will decide on the items for 'personal domain of stigma' and 'professional domain of stigma' either by adopting the available items from the available validated measurement tools or by developing new items. For instance, we will search the relevant sources of information, that is, published articles, book chapters, organisational documents like international and national codes of professional conduct and ethics in the health field to develop new items for 'professional domain of stigma'.[2 13 33–38] We anticipate that common themes reflecting the traits of professionalism could be extracted from the above said sources of information. For example, fear of contagion, risks of infectivity, confidentiality and resource allocation could be the themes that might surface.
3. We will design the new items as such to capture the interplay between a social, either professional or personal, responsibility and a potentially stigmatised (HIV positive) or non-stigmatised (HIV negative) characteristic.
4. We will draft the finalised items to create a scale—a questionnaire—and will validate it.

We will administer the measurement tool in a series of time points to capture any change(s) in attitude.

Data collection

We will collect the data using the newly developed questionnaire by administering paper-based and/or online surveys. The online version of the survey will be available via the 'Blackboard' class management system, with a link in the announcements as the student's login (Australia). The paper-based version will be distributed in classrooms at the end of the taught session (Malaysia). There is no risk of students receiving the online version also receiving the paper-based version.

The questionnaire will contain demographic questions and the initial item pool of questions on HIV/AIDS-related stigma. We will also provide each participant with the questionnaire and explanatory statement —describing the purpose of the research, methods, etc.

Participating sites

We anticipate that healthcare students from each year will be invited to participate in the study over a 1-year period. This will allow us to examine differences between the level of stigmatising attitudes between year-group cohorts, controlling for appropriate covariates, such as age, sex, ethnographic backgrounds, cultural backgrounds and course.

DISCUSSION

Definitions

In the context of future healthcare professionals, the years towards the professional development could be considered as one indicator of professionalisation. Clinical knowledge, as well as knowledge of contagion and transmission, will increase with years in a healthcare programme. Within a modern healthcare programme, however, there is also a focus on professional ethics and professional practice—often implicit rather than explicit —probably increasing with the shift from preclinical to clinical years in a programme. Under these circumstances, the years of training becomes a reasonable indicator of professionalisation. Unfortunately, professionalism then becomes confounded by knowledge of transmission.

Strengths and weaknesses

The strength of the study is the two-point in time longitudinal design that will enable us to investigate the relationship between stigmatising attitude towards PLWHA and professionalisation by looking at change(s) in attitudes over a time period.

The approach to sampling, which is not an ideal but a constraint placed by ethical requirements, raises the possibility of a selection bias. In a more general invitation to participate given to all students, those with particular

attitudinal dispositions (or dispositions to change attitudes with professional exposure) may self-select. This needs to be noted as a limitation, and may warrant further study. However, the nature of the hypothesis that participants will change on one dimension of stigma attitudes but not another seems to provide some protection against the plausibility of the selection bias as an explanation for any observed difference.

The lack of a universally accepted measure of 'professionalism'[39–41] in healthcare students or the healthcare workforce is an issue. However, within the context of this study, years of study is a reasonable indicator in the first instance.

Moreover, the bifurcation of social attitude into the private and professional domains might be less distinctive than anticipated, and requires large samples to detect the differences. We also anticipate collecting the self-reported attitude rather than the actual attitude and this, of course, would also raise questions about the practical importance of the issue, which could be a finding in its own right.

Conclusion

A fair and responsive health system requires a healthcare workforce that is blind to the 'undeserving' and the 'morally reprehensible'. If we do not gain a better understanding of the relationship between professionalisation and negative social attitudes and behaviour towards the socially marginalised, we are in danger of recreating a tiered healthcare system each time a new disease or a new social group is devalued. Notwithstanding the measurement challenges outlined here, the implications for professional education and the health systems agenda are sufficiently important to warrant further investigation.

Ethics and dissemination

Participation in this study will be completely voluntary, where the completion and return of the questionnaire will be taken as consent. This protocol has been approved by the Monash University Human Research Ethics Committee (approval number: CF12/0829–201200368) and categorised as low risk.

Data deposition

We will keep the data in a locked filing cabinet in the Monash University (Sunway campus) premises for 5 years, after which the information will be shredded and disposed of in secure bins, and digital recordings will be erased in accordance with Monash University's regulations. Only the principal investigator and the researcher will have access to the filing cabinet.

Dissemination plan

We aim to present and publish the results of this study in national and international conferences and peer-reviewed journals, respectively.

Contributors KA developed the concept and DDR reshaped it. KA and DDR have made substantive intellectual contributions to the manuscript. PA and MAAH have revised the manuscript critically and have improved the presentation of the ideas. All four authors have given final approval the publication of the manuscript.

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Competing interests None.

Ethics approval MBBS executive committee and Monash University Human Research Ethics Committee.

Provenance and peer review Not commissioned; externally peer reviewed.

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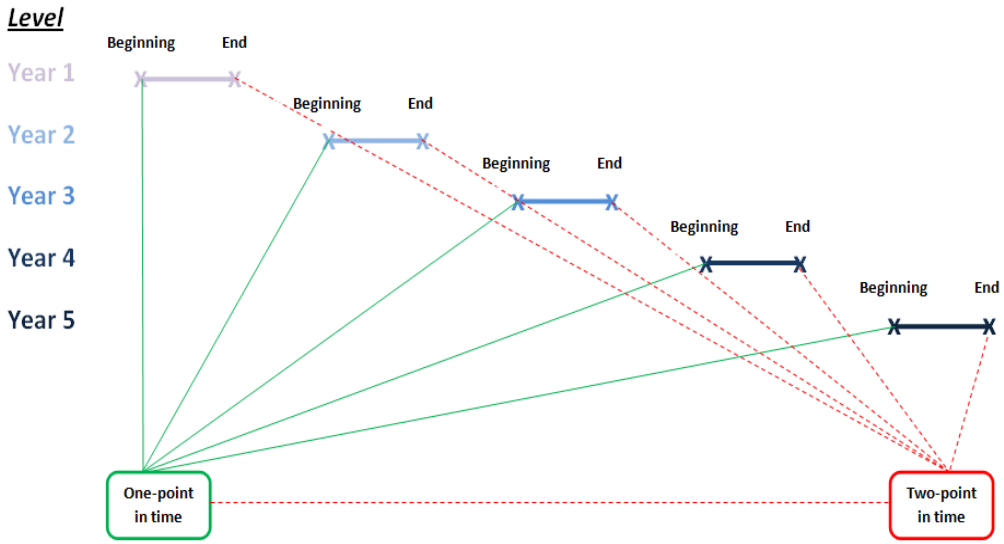
We repost the colored version of study design figure (Figure 1 of the protocol paper) for a better visual presentation of the proposed two point-in-time data collection method. The data collection time point are color coded i.e., the green color represents the data collection at the beginning of academic year for each cohort (cohort one to cohort five); and the red color represents the data collection at the end of each academic year.

Figure 4: Proposed study design for the medical students



Part II

3.2 Introduction

The study protocol identified the lack of an appropriate survey tool for measuring healthcare students' levels of professional and personal stigmatizing attitudes towards PLWHA. In this section we describe the review of the literature that lead to the conclusions and the semi Delphi approach we adopted to overcome it.

3.2.1 Survey design and procedure

Literature published by April 2011 was reviewed using databases i.e., Scopus; PsycINFO; ScienceDirect; Web of Science; Google Scholar; and Wiley online library. The review only included the quantitative measurement of any aspects of HIV/AIDS-related sigma. References were collected through a search on the keywords stigma or discrimination combined with "development", "validity", "reliability", ''scales'', ''measurement'' or ''assessment''. The same search was used for title words. In addition, relevant bibliographies as well as reports and publications not formally published in scientific journals were scanned for additional references.

Only English language papers and reports that included the scale items, questions or indicators used or developed, or for which these were available separately, were included in the review. With a few exceptions, only papers describing the actual development of the tool(s) were reviewed. Where additional studies, for instance, those that offered further validation of a particular instrument or validation in different health field, these were also included. Table 1 lists the selected searched studies that described the development, adaptation, validation and further validation of tools (questionnaires) measuring HIV/AIDS-related stigma.

Table 1: Selected published measurement tools measuring HIV/AIDS-related stigma

Country	Reference	Year	Target population	Sample size	Remarks
N/A	Technical Meeting to consolidate HIV Stigma Measures and Measurement Tools(177)	2009	N/A	N/A	Meeting participants achieved agreement on the critical area that need to be measured when assessing HIV stigma and discrimination. These critical areas are: - Fear of infection - Prejudice and stereotypes - Anticipated stigma - Internalized stigma - Experienced stigma - Stigma by association[13]
N/A	HIV testing, treatment and prevention: generic tools for operational research (178)	2009	N/A	N/A	The HIV/AIDS Department of the World Health Organization (WHO) developed tools for operational research on topics that have relevance to HIV/AIDS-related stigma research. This document suggests good items, per se, to measuring HIV/AIDS stigma in different populations.

[13] Stigma by association includes the discrimination experienced for associating with or caring for people living with HIV; or a person involved in sex work; drug use; or same sex activities.

Table 1 (Continued)

Country	Reference	Year	Target population	Sample size	Remarks
China	Zhao *et al.*(19)	2006-2007	AIDS orphaned children; vulnerable children; and comparison children aged 6-18 years[14].	1625 (755 AIDS orphan, 466 vulnerable children, 404 comparison children)	Stigma Against Children Affected by AIDS (SACAA) scale was developed and its psychometric properties were evaluated. The study focused on three main aspects of stigma: - Social sanction or exclusion. - Purposeful avoidance. - Perception of inferior qualities.
USA	Kelly *et al.*(147)	1988	Practicing nurses; mean age = 39.7 years; 94% female	Out of 500 nurses 136 completed and returned the survey.	There were no validity and reliability testing performed. The findings were reported in regards with the attitudinal analysis of the participants to the hypothetical scenarios presented.
USA	Kelly *et al.* (179)	1989	Undergraduate university students and gay men aged 17-63 years.	691 (360 undergraduate university students and 331 gay men)	AIDS risk behavior knowledge scale was developed and its psychometric properties were evaluated. It was concluded that the newly developed 40-item tool could reliably measure the HIV risk knowledge.

[14] AIDS orphaned children are those who lost one or both of their parents to HIV/AIDS; vulnerable children are those who were living with HIV-infected parents; and comparison children are those who were from the same community and had no HIV-related illness or death in their family.

Table.1 (Continued)

Country	Reference	Year	Target population	Sample size	Remarks
USA	Shrum *et al*.(180)	1989	College students	164 (phase 1), 135 (phase 2)	The AIDS Attitude Scale (AAS) was developed and its reliability and validity were evaluated. AAS contained 54 items; and included three key components about AIDS. These key components are: - Contact/Proximity to a person with AIDS. - Moral issues. - Legal/Social welfare issues.
USA	Snell *et al*.(181,182)	1991	N/A	N/A	The Stereotypes About AIDS Questionnaire (SAAQ) is a validated multidimensional measure of stereotype about AIDS. SAAQ measures 4 main categories of AID-related stereotypes with multiple subscales for each category. Four categories are: - Global stereotypic beliefs about AIDS. - Personal attitudes about AIDS. - Medical issues about AIDS. - Sexual issues about AIDS.

Table.1 (Continued)

Country	Reference	Year	Target population	Sample size	Remarks
USA	Ross and Hunter(183)	1991	Health professionals or in training: Male, mean age= 30.8 years; Female, mean age= 27.5	134 (19 males and 115 females)	The dimensionality of the 36-item validated Fear of AIDS Schedule (FAIDSS)[15]questionnaire inclusive of a 100-mm vertical visual analogue asking to what extent HIV-infected patients were responsible for their '*present difficulties'* was established. The identified dimensions of fear of AIDS in health professionals were: - Fear of loss of control. - Fear of sex. - Fear of HIV infection through blood and illness - Fear of death and medical interventions - Fear of contact with outsiders.
USA	Froman *et al.*(73)	1992	Undergraduate and postgraduate nursing students aged 17-48 (first sampling round).	First sampling round: 167 (7 male and 160 female) Second sampling round: 203	The validated 21-item AIDS Attitude Scale (AAS) had strong psychometric properties and measured 2 dimensions of AIDS attitude: - Empathy - Avoidance

[15] FAIDSS was developed by Arrindell e*t al*. in 1989. (184)

Table.1 (Continued)

Country	Reference	Year	Target population	Sample size	Remarks
USA	Zimet *et al.*(185)	1992	Junior high school and senior high school students	672	The 22-item AIDS knowledge scale, which was one part of a questionnaire that addressed a variety of issues about AIDS, was evaluated for its reliability. The scale's internal consistency was re-established using Spearman-Brown split half reliability test.
USA	Herek and Capitanio(74)	1993	General population at least 18 years of age	First sample: 538 (English-speaking) Second sample: 607(African-American English-speaking)[16]	There were no tests of validity and reliability reported. Nonetheless, various aspects of AIDS-related stigma were assessed. These different manifestations are: - Negative feelings toward persons with AIDS. - Support for coercive AIDS-related policies such as quarantine. - Blame for persons with AIDS. - Intentions to avoid a person with AIDS.

[16] As the black population was oversampled, only 263 out of 607 interviews were analyzed in this paper.

Table.1 (Continued)

Country	Reference	Year	Target population	Sample size	Remarks
USA	Harrison *et al.*(170)	1994	Nurses	225	The 11-item scale was developed and its validity and reliability were established. This scale had three subscales measuring the following: - Willingness to care for those who are HIV positive, homosexuals, and intravenous drug users as patients. - Attitudes toward homosexuals and intravenous drug users. - General conservative views on religious, political and family issues.
USA	Dubbert *et al.*(75)	1994	Nurses	20	The 13-item Nursing Willingness Questionnaire (NWQ). The NWQ was found to be a valid, reliable tool. Principal component analysis (PCA)[17] found that all of the 13 items loaded on a single factor i.e., - Fear of contracting AIDS through nonsexual, interpersonal contacts and medical procedure.

[17] Principal factor analysis was performed using the responses of 571 nurses of a study by Kemppainen *et al.*(186)

Table.1 (Continued)

Country	Reference	Year	Target population	Sample size	Remarks
USA	Mulford and Lee (187)	1996	Sociology students	876(460 males and 416 females)	The 17-item AIDS blame scale, consists of three subscales was developed Two out of three subscales i.e., stable/victim-blaming and society blaming demonstrated adequate construct validity and reliability.
USA	Carey *et al.*(188)	1997	Primary care health allies, undergraduate students, HIV/AIDS experts. Mean age =28.50 years	669(409 females and 227 males).	The 45-item HIV Knowledge Questionnaire (HIV-K-Q) was developed. Its validity and reliability were established and it had good psychometric properties.[18] Principal component analysis (PCA) showed that all of the 45 items loaded on a single factor i.e., HIV knowledge.
USA	Froman and Owen(189)	1997	Student nurses, nurses working in hospitals and community settings	478	The AIDS Attitude Scale (AAS)' validity and reliability was further supported by consolidation of a number of studies that had used AAS.

[18] There were 7 studies embedded in the main *Study*, each aimed at evaluating various parts of validity and reliability testing.

Table.1 (Continued)

Country	Reference	Year	Target population	Sample size	Remarks
USA	Fife and Wright(79)	2000	Persons having HIV/AIDS with the mean age of 37 and cancer patients with the mean age of 52	76 cancer patients and 130 HIV/AIDS patients	The 24-item scale measured the stigma and social impact of disease; and its two subscales were found to be valid and reliable. The four dimensions of this scale are: - Social rejection - Financial insecurity - Internalized shame - Social isolation
USA	Neil Abell(190)	2001	Caregivers of people living with AIDS (PLA)	155(47% male and 53% female)	The Willingness to Care scale (WTC) showed encouraging psychometric properties; and its validity and reliability were established.
USA	Berger *et al.*(191)	2001	Adults infected with HIV aged 18 or older. Mean age 37 years.	318	The final 40-item HIV stigma scale was validated and its reliability was established. Factor analysis yielded the following four subscales: - Personalized stigma. (18 items) - Disclosure. (10 items) - Negative self-image. (13 items) - Public attitudes. (20 items)

Table.1 (Continued)

Country	Reference	Year	Target population	Sample size	Remarks
USA	O'hea *et al.*(192)	2001	Undergraduate psychology students with median age of 20.	225(183 females and 42 males)	The 27-item Attitudes Toward Women with HIV/AIDS Scale (ATWAS) was developed and validated. Principal component analysis yielded four-factor structure: - Child care. - Myths/Negative Stereotypes. - Reproduction/Contraception issues. - Sympathy/Transmission Route.
USA	Carey and Shroder (193)	2002	Low income general public. Mean age = 33.36 years.	1019	The 18-item HIV knowledge questionnaire (HIV-KQ-18) was developed and showed high levels of internal consistency and test-retest reliability. This scale was a shortened version of the 45-item HIV-K-Q scale.
Thailand	Van Rie *et al.*(194)	2008	Patients with tuberculosis aged 18 or older seeking care at tuberculosis treatment centres. 22% of the tested patients were HIV positive.	204	The 21-item HIV/AIDS-stigma scale and the 23-item tuberculosis-related stigma scale were developed and their validity and reliability were established through exploratory and confirmatory methods. Both scales measured the stigma at both the community and patient/individual level.

3.2.2 Scale development

There were many publications on measuring the HIV/AIDS-related stigma in a *private* domain. Hence, it was decided to pool those items which seemed to be fit and suitable indicators in answering the objectives of this research.

In contrast, there appeared to be no/few papers describing measures suitable for measuring the HIV/AIDS-related stigma from a health professional point of view in a [virtual or actual] health working environment. It was apparent from a review of the identified instruments that none were designed for measuring the *professional* HIV/AIDS-related stigmatizing attitudes.

As a consequence we chose to adapt existing measures of HIV/AIDS-related stigmatizing attitudes in a private domain; and develop a tool for measuring professional HIV/AIDS-related stigmatizing attitudes using a semi Delphi technique. The following describes the approach in creating the HIV/AIDS-related measurement tool to measure professional and personal stigmatizing attitudes of healthcare students.

3.2.3 Literature search to define and operationalize the concept of professionalization

The relevant sources of information on professionalism and medical professionalism were searched to define set of indicators to measure professionalism. Some of these sources of information were published articles, book chapters, organizational documents like international and national code of professional conducts and ethics in health field (29,57,195–200).

The lack of universally accepted definitions of "professionalism"(43,65,163) in healthcare students or the healthcare workforce is a challenge. However, within the context of this study, years of study was agreed to be only reasonably available proxy for professional development in the first instance (201).

In the context of future healthcare professionals, the years of study could be considered the most reasonable proxy for professionalization. Clinical knowledge and skills, as well as knowledge of contagion and transmission will increase with years in a healthcare program. Within a modern healthcare program, however, there is also a focus on professional ethics and professional practice – often implicit rather than explicit – and this generally increases the shift from pre-clinical to clinical years in a program. Under these circumstances the years of training becomes a reasonable indicator of professionalization.

3.2.4 Modified Delphi (semi Delphi) technique

A two-round "modified Delphi technique" [19] (203–206) was used to gain agreement on the common domains of professionalism for inclusion in the measurement tool.

[19] In modified Delphi approach usually the brainstorming sessions – on creating the items for the agenda – is conducted via focus group discussions not necessarily in a systematic and structured manner. Then the agenda is discussed via series of structured communications with the panel of experts. Modified Delphi technique becomes viable when for some logistical reasons like time constraints and/or drained resources, the Delphi technique might not be the most efficient and effective approach.

It seems that the modus operandi of the **"United Nations Security Council"** on preparing agenda for its meetings mirror the steps involved in the "Modified Delphi" technique.(202)

The Delphi[20] technique was a serial structured communication method, developed by 'the RAND Corporation', aims at extracting and refining the elements of consensus from expert panelists (204,207,208). The Delphi technique is narrated in honor of the mythical power of the Pythia, the so called oracle of Delphi, who were known for their wise counsel and prophetic predictions.

The first Delphi method was used, in the late 40s (204,209). In this interactive method a series of communications ensue between a panel of experts (204,207). The Delphi technique is based on the view that individual expert opinions are less robust than decisions by expert panels; and structured approaches are more robust than unstructured approaches. This method has endured changes and new approaches to it have evolved over the time: "*e-Delphi"*, for example, is one of these changes.

The Delphi technique is proven to be useful, despite its limitations, provided the researchers are well aware of the objectives and outcomes of their projects (204,206,207,209). In addition to being time and resource intensive, one of the main criticisms of the Delphi technique is the challenges with the validity and reliability of this technique; and the argument that this technique may reflect consent rather than a correct decision (210). However, a consensus reached by a structured group i.e., a panel of experts is proven to be the reflection of a correct and truthful forecast or decision (211).

[20] For a detailed description of the "Delphi" technique in the context of health research, see the book titled: *The Delphi Technique in Nursing and Health Research* by Sinead Keeney, Felicity Hasson and Hugh McKenna. ISBN: 978-1-405-18754-1

We modified the Delphi technique to reduce the time and resource pressure. The panel of experts consisted of eight full-time faculty members out of whom two were physicians; two were clinical pharmacists; one was a nurse and anthropologist; two were epidemiologists; and one was a psychologist. Each of the panelists had more than five years of clinical experience.

The process was iterated over two rounds. In the first round, via focus group discussions, the main facets and domains of the measurement tool were discussed based on the "personal domains of stigma" versus the "professional domain of stigma in the context of a health professional's work environment".

In the second round, one hundred and sixty five items (either questions or statements) were proposed to measure *"professionalism"* as well as *"attitudinal knowledge of HIV's route of transmission".* Altogether seventy nine items were chosen after the second round. Consensus was operationalized as agreement between at least six of all eight panelists i.e., if more than 75% of the panelists agreed with the questions/statements.

The following section presents a more detailed and descriptive discussion of the processes involved in the creation of the measurement tool –a questionnaire.

3.2.5 Item selection and item creation

In the second round, one of the aims was to have subjective and argumentative views about the extent to which the collected items, which were assembled via review of the relevant literature, were suitable for inclusion in the final measurement tool (204).

The panel also concurred to adopt those items that were fit and suitable to measuring the HIV/AIDS-related stigmatizing attitude in personal (private) domain; as the published literature was replete with the validated measurement tools that could measure the HIV/AIDS-related stigmatizing attitudes from a personal point of view.

On the other hand, after the focus group discussions, a set of indicators to be included in the primary measure of the professional domains of HIV/AIDS stigmatizing attitude had been already established. An initial pool of items were constructed and distributed to the panelists. The new items were designed as such to capture the interplay between a social –either professional or personal - responsibility and a potentially stigmatized (HIV positive) or non-stigmatized (HIV negative) characteristic. Moreover, the parallel items were also developed to measure the interplay between the professionalism and the stigmatizing attitudes towards HIV/AIDS. For instance, a question was *"if the government should provide free healthcare to people living with HIV/AIDS?"* and its parallel question was *"if the government should provide free healthcare to type II diabetic patients"*.

3.2.6 Item evaluation and finalization (Content validity)

The panel agreed that the 165 presented items were inclusive of:

a) Attitudinal knowledge items about the routes of HIV transmission; and

b) An appropriate balance between the items that describe the sets of professional roles and responsibilities expected from the health professionals in a health environment as well as in a personal (private) situations.

Out of hundred and sixty five proposed items (either questions or statements), eleven attitudinal knowledge items and sixty eight items in six domains of professionalism reached consensus after the second round. (See Appendix X and Appendix XI).

Each of these items was considered consensus if more than 75% (6 out of 8 experts) agreed with the questions/statements. These items were eventually drafted to create two measurement tools –questionnaires- i.e., one questionnaire for medical students and the other one for pharmacy students.

The two questionnaires were similar, except for the two additional questions- parallel items- in the questionnaire for medical students that aimed at measuring decision making in a hypothetical health environment. (See Appendix X and Appendix XI). Finally, the items in each of the two questionnaires were evaluated for clarity, wording and representativeness of the contents.

Subsequently an outline was proposed for the measurement tool –a questionnaire – that had four main parts i.e.,

1- The demographics.

2- Series of independent items to establish some aspects of the questionnaire's validity. These items were YES/ NO questions aiming at measuring attitudinal knowledge of routes of HIV transmission. In the second round of data collection these independent items were replaced by a series of questions examining the *"clinical knowledge"* of routes of HIV transmission.

3- Series of items (indicators) measuring HIV/AIDS-related stigma from a personal (private) point of view.

4- Series of items (indicators) measuring HIV/AIDS-related stigma from a professional (healthcare) point of view.

The instrument was concurrently validated using first year Monash student cohorts.

3.2.7 Data collection

The finalized items were administered in a two-point in time fashion i.e., at the beginnings of the educational year (within the first 2 months) and at the end of the same educational year (within the last 3 months); to capture the change(s) in attitude.

Data were collected using the newly developed questionnaire by administering paper based and on-line surveys. The questionnaire contained demographic questions and the initial item pool of questions on HIV/AIDS-related stigma. Each participant was also provided with a set of study protocol and explanatory statement – describing the purpose of the research, methods, etc. Participation in this study was completely voluntary and no written consents were taken as per instructions by the Monash University Human Research Ethics Committee (MUHREC).

In Malaysia the research student with the prior permission from the program coordinators approached the students after their lectures and practical sessions to administer the questionnaire. Similarly, the program coordinators in the Australian

campuses were approached to help in uploading the survey link onto the Blackboard. There were no incentives for the participants in this study.

3.2.8 Ethics approval

Participation in this study was completely voluntary, where completion and return of the questionnaire was taken as consent. This study was approved by a) Monash MBBS committee; b) the Monash University Human Research Ethics Committee (Approval number: CF12/0829 – 201200368). Moreover, the permission to conduct this study was granted by the dean of school of pharmaceutical sciences, Universiti Sains Malaysia (USM).

3.2.9 Measurement tools' validation

This segment of chapter three adumbrates the findings of two separate statistical analyses that aimed at validating the newly developed measurement tools. The analyses are presented in two subsections. Subsection I highlights the results of Mokken scaling analysis (MSA). In the second subsection we present the findings of principal component analysis (PCA). The findings of subsection I and II lend further support to the inferences derived in the last section. MSA and PCA yielded two validated and reliable measurement tool that measured the HIV/AIDS-related stigma in "*personal"* and *"professional*" domains, separately.

Lastly, in section III we describe the generalized estimating equation (GEE) modeling technique applied to the data to test the hypothesis i.e., "*bifurcation of HIV/AIDS-related stigmatizing attitudes of healthcare students*". The findings presented in the next three consecutive chapters i.e., *Results I, Results II* and *Results III* are the inferences derived from employing GEE techniques to model HIV/AIDS-related stigmatizing attitudes conditioned on the variables; predictors; and their

interaction. For example, variables were program, site, gender; and predictors such as year of the study, etc.

Subsection I[21]

3.3 *Personal* stigma scale development and validation

Introduction

Researchers have described HIV/AIDS related stigma across populations and across domains of interpersonal interaction (81,102,212–215). Of the many forms of HIV/AIDS related stigma that have been described, one of forms with the greatest potential for lasting harm is the stigma by healthcare professionals towards people living with HIV/AIDS (PLWHA). The negative attitudes compromise the quality of care to PLWHA, and can affect the willingness of PLWHA to access health settings in which they are the subject of stigmatizing responses from staff (17,18,216).

Dealing with the attitudes of healthcare professionals is central to the management of this form of HIV/AIDS stigma. The management strategies may include post-qualification training or the integration of the stigmatizing attitude issues in the educational curriculum of healthcare professionals during their initial training. The relative merits of these strategies are subject to empirical investigation, and there is no reason to believe that they are not complementary. However, whichever strategy is adopted, the measurement of change in stigmatizing attitudes is a key to the assessment of the effectiveness of the intervention. There is therefore a strong case for robust measures of HIV/AIDS related stigma, developed for healthcare professionals.

[21] Subsection I is submitted as a research article to BMC Medical Education journal, ISSN: 1472-6920. The article is currently under review.

A number of HIV/AIDS stigma scales have been developed to measure stigmatizing attitudes towards PLWHA (217–219). The approach to scale development has tended to rely on classical test theory, and assumed that each item (question) measured the true score (level of stigma) with error for each person (220). Good items to include in a stigma scale were selected on the basis of their pooled reliability, or in combination with Principal Component Analysis (PCA) according to their loading on a single dimension (192). The approach makes assumptions about the normality Gaussian nature of the distribution of the responses to each item.

Mokken Scale Analysis

Mokken scale analysis (MSA) is a nonparametric hierarchical scaling technique related to Guttman scaling, and falls under the umbrella of nonparametric item response theory (IRT) (220,221). The point of departure from classical test theory is the underlying assumption that the probability of a person responding in a particular way to an item depends on their personal latent trait e.g., how stigmatizing their attitudes towards PLWHA actually are; and on the characteristics of the item itself i.e., how demanding or difficult an item is in terms of eliciting a negative response towards PLWHA. Thus, MSA orders people according to their probability of responding in a stigmatizing manner i.e., the latent trait – the monotone homogeneity (MH) assumption. MSA technique also orders items according to the probability of being answered in a stigmatizing manner independent of the person answering the question – the double monotonicity (DM) assumption. If the MH and DM assumptions both hold, then a Mokken scale is established that can order *people* along a latent trait of stigmatizing attitudes and order the *items* in the scale on their "difficulty".

The advantage of MSA is that it can be used to develop unidimensional cumulative scales that are usually shorter than scales developed using other approaches, while retaining acceptable psychometric properties (220,222). Mokken scales also make no distributional assumptions about the underlying data, other than that the data are capable of being ordered by *item* and by *person*.

In an attempt to understand Mokken scales better; and also to compare the Mokken Scale Analysis technique with the Principal Component Analysis technique, we conducted a secondary data analysis on a household expenditure data from a Vietnam health survey[22] (223). The Mokken scale of measure of household socio-economic position, was shorter than the measure of household socio-economic position developed by PCA technique. Moreover, the Mokken scale outperformed the PCA measure in measuring the wealth and purchasing power of households (223). This finding, therefore, gave us with more confidence in applying MSA to create a shorter measurement tool with acceptable psychometric properties.

The aim of this study was to develop a short measure of HIV/AIDS related stigma for use among healthcare professionals (in training) that had sound psychometric properties.

Methods

Study design, participants and data collection

A cross sectional survey was carried out of healthcare students studying at Monash University campuses in Malaysia and Australia. A total of 807 students ($N = 807$) drawn from medicine and pharmacy programs responded to the survey. Sixty-

[22] To view the above-said article you may refer to **Appendix II** on page 233.

two percent (62%) of the students were female (*n=500, mean age=21.2, SD=2.46*) and 38% were male (*n=307, mean age=21.1, SD=2.11*).

Procedure

The respondents completed paper-based (Malaysia) or on-line (Australia) surveys that contained demographic questions and the initial item pool of potential questions for inclusion in healthcare professionals stigma scale.

The initial pool contained 25 items based on a review of the literature – removing redundant or conceptually similar questions (See Appendix). Each question in the pool required a response on a seven-point scale noting the degree to which a respondent agreed with the questions and statements i.e., 1- Agree strongly, to 7-Disagree strongly, or 1-Definitely NO to 7-Definitely YES. Prior to analysis all answers were recoded (to run these tests in *mokken* package answers should be numerical) such that 0 indicated the lowest level of stigmatizing attitude and 6 represented the highest level. Examples of the questions in the item pool are shown in the Appendix.

Data Analysis

The MSA was conducted using the *mokken* package in the R statistical environment (224,225). The approach is still relatively unusual in the literature; and a more detailed description than is usual for a *Methods* section is provided as a guide. Readers interested in even greater detail should refer to publications on Mokken analysis by *van der Ark* and *Sijtsma* (222,225–227).

The analysis considers five interrelated elements: the Loevinger's H scalability coefficient; the MH assumption that *people* can be monotonically ordered

according to their responses to the items; the DM assumption that *items* can be monotonically ordered according to people's responses; the reliability of the final scale (i.e., Cronbach's alpha) (227); and the validity of the scale including face and convergent validity (228).

Loevinger's *H* coefficients are important in testing and constructing Mokken scales. The scalability coefficient for each item (H_i), item pair (H_{ij}), whole scale (H) and transposed Mokken scale (H^T) may range from 0 to 1 (220,225). The *H* coefficient for each single item as well as for the scale has to be more than 0.30 to satisfy the assumptions of Mokken scale (220). Widely accepted rules of thumb have developed around the use of the H coefficients, such that $0.30 \leq H < 0.40$ indicates a weak Mokken scale; $0.40 \leq H < 0.50$ a moderate Mokken scale and more than 0.50 a strong Mokken scale (225).

Evaluation of the MH assumption

Within a pool of items, more than one scale may be present. The mokken package for R estimates the available, possible, Mokken scales from the data using an automated item selection procedure (AISP) with a default lower bound partition coefficient (c = 0.3) (225). Although initial items in a pool are selected by researchers with an assumption that they represent a unidimensional scale, the analysis may reveal more than one scale. The automated item selection procedure uses a hierarchical clustering algorithm that partitions a set of items into potential scales that each satisfy the basic MH assumptions (ordering of people), leaving out the items with *H* coefficients less than 0.30 as unscalable (226).

The main objective of the selection procedure is to select as many good items as possible in the first Mokken scale, which supports the monotonic ordering of people. The computed Mokken scale is the collation of items that measure a single latent trait; i.e., supports a unidimensional view of the scale. A recent innovation in the selection procedure was the implementation of a genetic algorithm to improve the partitioning of the search space (226); and it was this algorithm that was used in the present study. The monotonicity of the MH assumption was further tested using a secondary function built into the package– "*check.monotonicity"*.

Evaluation of the DM assumption

The mokken package has equivalent functions to test the DM assumption that examine Invariant Item Ordering (IIO) of *items* and Manifest Invariant Item Ordering (MIIO) – interested readers are referred to the article titled *"New Developments in Mokken Scale Analysis in R*" (226). MIIO is designed for polytomous items and orders items by their mean score, such that the selected items follow the hierarchy from the least difficult to the most difficult item (220,225). The MIIO method identifies item pairs that violate the assumptions of Double Monotonicity and items are successively removed from a potential scale until no significant violations remain (226). Eventually, the DM assumptions can be visually confirmed using P-matrices function (225).

A summary statistic "Crit(ical)" is automatically generated that provides an overview of different indicators and can be used as a guide to discard the item(s) violating MH and/or DM assumptions (220). Crit values greater than 80, for instance, can indicate poor items (226). Once invariant item ordering has been established, the transposed Mokken scale coefficient (H^T) is used to express the accuracy of the

ordering of the items in the Mokken scale (222). When $0.30 \leq H^T < 0.40$ occurs, it is interpreted as a weak ordering of items, $0.40 \leq H^T < 0.50$ is interpreted as a moderate ordering, and $H^T > 0.50$ is interpreted as a strong ordering (226).

Validity

The construct validity of the final scale was examined in terms of both face validity and convergent validity (228). The convergent validity was established by examining the relationship between the final scale and six independent "yes-no" questions asking about attitudes towards people living with HIV/AIDS (See Appendix). Specifically, respondents were grouped by the number of questions to which they responded negatively towards PLWHA; resulting in 7-groups of respondents from those showing no negative attitudes (1) to those showing negative attitudes to every question (7).

Results

The automated item selection procedure – with lowerbound partition coefficient set to 0.3 – using the genetic algorithm, initially partitioned the 25-item questionnaire into a unidimensional, 19-item Mokken scale conforming to the MH assumptions of the model. This step removed 6 items with low item scalability coefficients (Hi<0.30). The Loevinger's scalability coefficient for the remaining items indicated a moderate Mokken scale (H = 0.43). (See Appendix)

A further 10 items were removed from the 19-item scale because they did not support the DM (item ordering) assumptions of the model, generating a final 9-item Mokken scale. This final scale had an H coefficient indicating a strong scale (H=0.54) with good reliability properties (Cronbach's $\alpha = 0.89$). The HT coefficient

further supported the notion that the scale items were monotonically ordered relative to one another and also along the latent trait ($H^T = 0.53$). The DM assumptions of the final scale were also checked by examining the P-matrices and found to be adequate (225). The dimensionality of the scale was further tested using principal component analysis (PCA) (229). A visual examination of the scree-plot indicated the presence of a single (unidimensional) scale. The final 9-item scale, ordering items from the least difficult item to the most difficult item is shown in Table 2.

Table 2: The final 9-item HIV/AIDS stigma scale ordered from least to most difficult item

Item Nr.	Mean score*	Item	Item H	Violation	Crit
1	0.86	People with HIV should **NOT** be bus drivers.	0.61	0	0
2	1.05	People with HIV should **NOT** be religious leaders.	0.53	1	39
3	1.06	People with HIV should **NOT** be police officers.	0.56	2	46
4	1.15	If you come to know that your friend is HIV positive, would you continue your friendship with him/her?	0.57	1	23
5	1.27	If you come to know that your colleague is HIV positive, would you continue working with him/her?	0.56	0	0
6	1.80	Would you allow your HIV positive friend to use your bathroom?	0.55	1	60
7	1.89	Would you discourage your sibling from becoming friends with healthcare professionals/AIDS person?	0.52	1	62
8	2.66	Would you send your child to a school where one of its teachers is HIV positive?	0.55	0	0
9	4.13	A family has a right to know if a member is infected with HIV and this is more important than a family member's right to privacy.	0.43	0	0

Note.- Loevinger's scale coefficient H computed on the transposed Mokken scale $H^T = 0.53$; H = 0.54; *reliability* $\alpha = 0.89$.
**Mean score ranges from 0 to 6.*

All but one of the items (item 9) showed strong scale properties (H>.5). No serious violations occurred, and the Crit values were all within acceptable limits.

Table 3 shows the distribution of response scores, that is, the number of responses to each of the answer categories for each of the nine items of the final scale. To simplify the interpretation the response distribution is shown visually. The categorical endpoints are shown: category 1 (non-stigmatizing attitude) and category 7 (highly stigmatizing attitude). Responses to the intermediate categories, however, are aggregated.

Table 3: Response distribution for each of the nine items of the final scale with numbers of respondents in each category

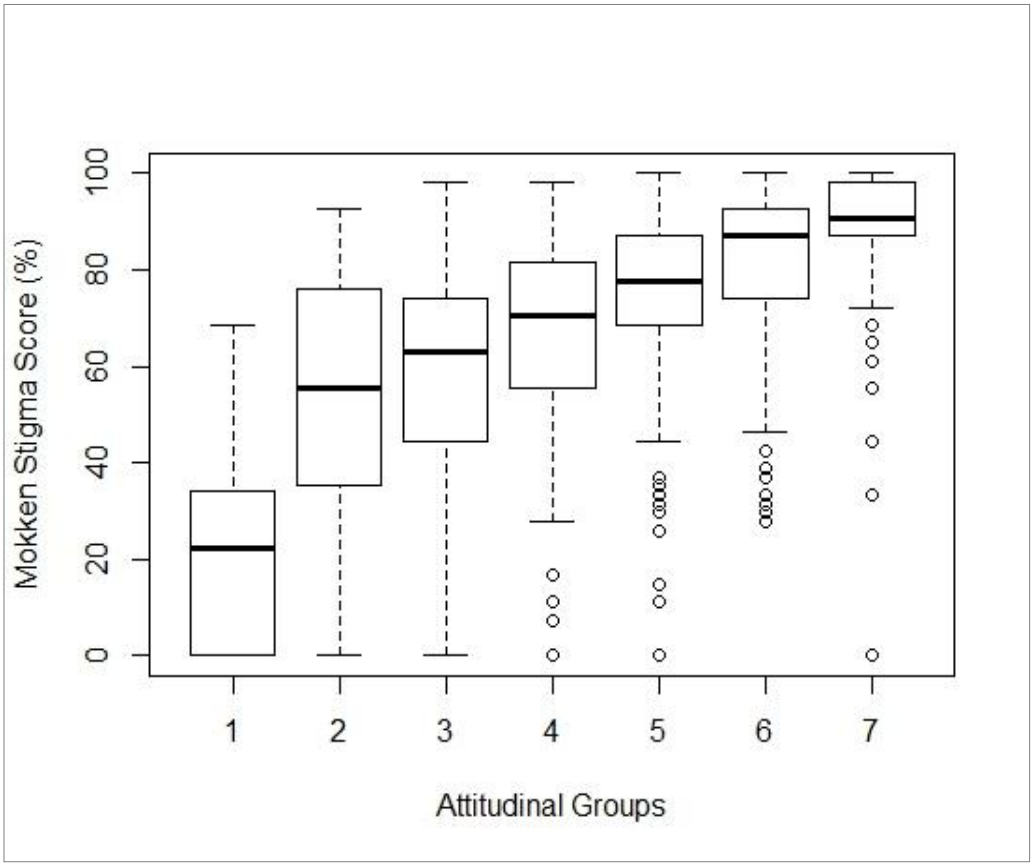
Items	Response distribution		
1. People with HIV should **NOT** be bus drivers.	**547**	**190**	**70**
	1*	2 to 6	7*
2. People with HIV should **NOT** be religious leaders.	**522**	**194**	**91**
	1	2 to 6	7
3. People with HIV should **NOT** be police officers.	**507**	**218**	**82**
	1	2 to 6	7
4. If you come to know that your friend is HIV positive, would you continue your friendship with him/her?	**451**	**269**	**87**
	1	2 to 6	7
5. If you come to know that your colleague is HIV positive, would you continue working with him/her?	**414**	**305**	**88**
	1	2 to 6	7
6. Would you allow your HIV positive friend to use your bathroom?	**358**	**297**	**152**
	1	2 to 6	7
7. Would you discourage your sibling from becoming friends with healthcare professionals/AIDS person?	**314**	**351**	**142**
	1	2 to 6	7
8. Would you send your child to a school where one of its teachers is HIV positive?	**193**	**394**	**220**
	1	2 to 6	7
9. A family has a right to know if a member is infected with HIV and this is more important than a family member's right to privacy.	**81**	**395**	**331**
	1	2 to 6	7

Note.- Total number of respondents (N=807).
**1 non-stigmatizing attitude – 7 highly stigmatizing attitude.*
The numbers of respondents for the answer categories 2 to 6 are reported collectively.

The increase in the numbers holding highly stigmatizing attitudes (and concomitant decrease in numbers holding non-stigmatizing attitudes) is readily apparent. Sixty-eight percent (67.8%) of respondents had no stigmatizing attitudes to the idea of a bus driver with HIV/AIDS. In contrast, only 10.0% maintained that same low level of no stigmatizing attitudes when asked whether a HIV positive person was entitled to maintain their right to privacy. Using the 9 scale-items identified through the MSA, a final HIV/AIDS-stigma score was estimated for each respondent (mean = 70.6, SD = 24.34).

The convergent validity of the final scale was examined using a boxplot showing the distribution of stigma scores within each of the 7 attitudinal groups, where Group 7 contains individuals responding negatively to all convergent validity questions, Group 6 contains individuals responding negatively to 6 of the 7 questions, down to Group 1 containing individuals who did not respond negatively to any of the questions. (See Figure 5)

Figure 5: Convergent validity of the final scale



The monotonically increasing, relationship between stigma score and group readily confirms the convergent validity of the scale score. The medians are strictly monotonic and increasing, as are the first quartile scores. With one small exception (Group 2) the third quartile scores are also monotonic and increasing.

Discussion

Several scales for measuring HIV/AIDS related stigma have been developed previously (217–219). These have relied almost exclusively on classical test theory approaches which make assumptions about the underlying normality of the distribution of responses and make no allowance for the item-trait relationship (230).

The results of the this Mokken scale analysis produced a shorter (9-item), strong (H>.5), and reliable (α=.89) scale with a logical hierarchy of item "difficulty", and an intuitive face validity (221). The convergent validity of the scale was also established for use with students in healthcare professions.

Unlike scales derived from classical test theory, one of the appealing features of MSA (and other latent trait approaches) is that a scale has utility beyond simply providing a total item score (231). A total score allows researchers to order people from low levels of stigma to high levels of stigma. With a Mokken scale, one can also infer relationships between items. The analysis indicated, for instance, that it was easier to be personally, socially involved with a person who is HIV positive (i.e., item 4) than it was to send one's child to a school where a teacher was HIV positive (i.e., item 8). This graded response of items (rather than simply people) is also consistent with the framework of stigmatizing responses described by which potentially provides insights into aspects of the social interaction or the kinds of social interactions that elicit more or less stigmatizing responses (232).

Limitation

There are two broad limitations associated with the analysis described here. There are some limitations on the generalizability of the findings. The sample, was of reasonable size – certainly larger than some studies e.g.,(233) – but drawn from a single university population – homogeneous at least with respect to their educational experience. By virtue of this, caution should be taken when generalizing the scale to healthcare professionals more broadly. However, it is worth noting that, as the focus of this study was on the development of a measurement tool and establishing its validity and reliability, and not on comparing the groups of people and generalizing

the findings, the data presented here could be considered adequate.(187) Moreover, there is some evidence to suggest that Mokken scales developed in a student population such as this are likely to generalize reasonably well to graduated healthcare professionals (234). This, nonetheless, remains an empirical question and warrants investigation with future uses of the scale in a new population.

Conclusion

This newly developed HIV/AIDS stigma scale works well in the population of this study; however, future research could examine the generalizability of this scale in other populations such as graduated and practicing healthcare professionals.

Appendix:

The 25-item questionnaire aimed at measuring HIV/AIDS stigmatizing attitude

Item Nr.	Item	Measure	Mokken Scale	Item H[b]
2	People with HIV should be barred from participating in contact sports like football.	HIV/AIDS stigma	1 [a]	0.34
4	People with HIV/AIDS should be isolated.	HIV/AIDS stigma	1 [a]	0.40
5	People with HIV should **NOT** be allowed to work in kindergartens.	HIV/AIDS stigma	1 [a]	0.39
6	People with HIV should **NOT** adopt children.	HIV/AIDS stigma	1 [a]	0.47
7	People with HIV should **NOT** be teachers.	HIV/AIDS stigma	1 [a]	0.57
8	People with HIV should **NOT** be religious leaders.	HIV/AIDS stigma	1 [a]	0.49
9	People with HIV should **NOT** be police officers.	HIV/AIDS stigma	1 [a]	0.54
10	People with HIV should **NOT** be bus drivers.	HIV/AIDS stigma	1 [a]	0.58
11	People with HIV should **NOT** be barbers.	HIV/AIDS stigma	1 [a]	0.43
12	People with HIV should be allowed to travel between the countries.	HIV/AIDS stigma	1 [a]	0.37
13	People with HIV/AIDS have the right **NOT** to reveal their status to their friends.	HIV/AIDS stigma	1 [a]	0.36
14	People with HIV/AIDS have the right **NOT** to reveal their status to their family.	HIV/AIDS stigma	1 [a]	0.32
16	A family has a right to know if a member is infected with HIV and this is more important than a family member's right to privacy.	HIV/AIDS stigma	1 [a]	0.41
17	Children with HIV in schools should be kept together in the same classroom.	HIV/AIDS stigma	1 [a]	0.31
20	If you come to know that your friend is HIV positive, would you continue your friendship with him/her?	HIV/AIDS stigma	1 [a]	0.46

21	Would you allow your HIV positive friend to use your bathroom?	HIV/AIDS stigma	1 [a]	0.44
22	If you come to know that your colleague is HIV positive, would you continue working with him/her?	HIV/AIDS stigma	1 [a]	0.46
23	Would you send your child to a school where one of its teachers is HIV positive?	HIV/AIDS stigma	1 [a]	0.45
24	Would you discourage your sibling from becoming friends with healthcare professionals/AIDS person?	HIV/AIDS stigma	1 [a]	0.41
1	Governments should provide free healthcare to people with Type 2 diabetes.	HIV/AIDS stigma	0	0.04
3	People with HIV/AIDS should be obliged to reveal their health condition to their doctor.	HIV/AIDS stigma	0	0.17
15	People with HIV/AIDS should be penalised if they have sexual relations without revealing their health status.	HIV/AIDS stigma	0	0.11
18	Governments should provide free healthcare to people with HIV/AIDS.	HIV/AIDS stigma	0	0.08
19	Would you discourage your sibling from becoming friends with your close friend who has recently become HIV positive?	HIV/AIDS stigma	0	0.13
25	You are given the choice of two possible individuals as your roommate. One is a basketball player and the other one is HIV positive. Which one would you be most likely to choose?	HIV/AIDS stigma	0	0.08

[a] Loevinger's scalability coefficient for the 19-item Mokken scale H = 0.43.
[b] Loevinger's scalability coefficient for each item.

Table 4: "yes-no" attitudinal knowledge questions asking about attitudes towards people living with HIV/AIDS

Question Nr.	Question	Measure
1	Would you use the eating utensils of a person with HIV/AIDS?	HIV/AIDS stigma
2	Would you continue to use the services of a dentist if you learned that s/he provides dental care for patients with HIV/AIDS in her/his practice?	HIV/AIDS stigma
3	Would you sit on a toilet that has been used by a person who you learn has HIV/AIDS?	HIV/AIDS stigma
4	Would you eat in a restaurant with kitchen staff who you know have HIV/AIDS?	HIV/AIDS stigma
5	Would you be concerned if you had to have a blood test in a laboratory that provides services to a lot of people with HIV/AIDS?	HIV/AIDS stigma
6	Should a mother who has HIV/AIDS avoid physical contact with her child?	HIV/AIDS stigma

Subsection II

3.4 *Professional* stigma scale development and validation

Introduction

HIV/AIDS is among top five causes of the global burden of disease (235) , and unprotected sex continues to be a leading risk of infection. (171,236) Antiretroviral agents are currently the best approach to long-term management (237,238).

One of the critical factors affecting the uptake and maintenance of an antiretroviral regimen is utilization of a functioning healthcare system, with one of the most significant impediments to utilization being the attitude of healthcare professionals within the services towards people living with HIV/AIDS (PLWHA) (96,165–168).

It has been established that HIV-related stigma in healthcare settings interferes with the optimal utilization of health services (11,17,18,165–167,169), and it is also well understood that lack of access to the prevention services of the healthcare system has been an obstacle to control the pandemic of HIV/AIDS. (171)

In order to manage the problem and implement effective interventions, tools are needed for the measurement of HIV/AIDS related stigma that are appropriate for use in healthcare professionals and healthcare professionals in training. Such tools would permit the monitoring and evaluation of stigma in healthcare settings. Surprisingly, relatively little work has been conducted on the measurement of HIV-related stigma in healthcare professionals (or those in training).

There are limitations with the robustness of the available HIV/AIDS stigma tool that measure the stigma amongst healthcare professionals. One of the limitations is the diversity of the populations under study and the holistic view on the definition of healthcare professionals by the researchers in such studies (96,183,239). For example, the study populations consist of medical doctors, nurses, pharmacists, lab technicians, occupational therapists, psychologists and social workers (96,183,239). Although from a holistic point of view all of the above-said professions come under the umbrella of healthcare professionals, the closeness and contact with an HIV positive patient varies vastly for any of these healthcare professionals (240). Therefore, the indiscriminatory view on social distancing (96,183,239) is one of the major obstacles that needs to be addressed.

Some of these scales, though of high quality, have intuitive limitations. For example, they are only validated for a culturally specific setting i.e., the Spanish speaking health professionals in training (96). Likewise, when an identical instrument is used to measure the HIV/AIDS-related stigma among doctors, nurses and laboratory technicians;(239) knowing that the job description and the nature of interaction with PLWHA, significantly varies among these health professionals.

In this contest, the aim of this study was to develop a brief scale, suitable for use in healthcare professionals (in training), that could measure HIV/AIDS related stigma in a healthcare environment.

Materials and Methods

Participants

Eight hundred and seven (807) medicine and pharmacy students studying at Monash University campuses in Malaysia and Australia participated in the present

study from all four (Pharmacy) or five (Medicine) years of the degree programs. 73% of the participants came from the Malaysia campus and 27% from Australia. Sixty-two percent (62%) of the students were female (*n=500, mean age=21.2, SD=2.46*) and 38% were male (*n=307, mean age=21.1, SD=2.11*).

Participation was informed and voluntary, and the research was approved by the Monash University Human Research Ethics Committee.

Materials

A questionnaire was distributed that contained (i) demographic questions, (ii) a pool of potential items to measure HIV/AIDS related stigmatizing attitudes in a healthcare setting, and (iii) additional HIV/AIDS attitude items for evaluating the convergent validity of the scale.

Demographic questions included age, sex, campus, course, and year of study. The initial pool of items to measure HIV/AIDS related stigma contained 19 items based on a review of the relevant literature (29,57,196,241) and discussions with content experts (See Appendix). Each item required a response on a seven-point scale noting the degree to which a respondent agreed with the questions and statements i.e., 1- Agree strongly, to 7-Disagree strongly, or 1-Definitely NO to 7-Definitely YES. Prior to data analysis all answers were recoded such that 0 indicated the lowest level of stigmatizing attitude and 6 represented the highest level.

Stigma was operationalized in terms of unwillingness to have interaction with PLWHA or to provide care to them in two different environment-driven trajectories:

1) A personal interaction with HIV/AIDS individuals in a private situation;

2) A professional interaction with HIV/AIDS patients in a healthcare situation.

The questions to establish convergent validity were five independent "yes-no" attitudinal knowledge questions asking about attitudes towards people living with HIV/AIDS (Appendix).

Procedure

For pragmatic reasons the survey (questionnaire for medical students – Appendix IX – and questionnaire for pharmacy students – Appendix X) was administered in two forms. A paper form was distributed in classes on the Malaysia Campus and an on-line form was made available to participants in Australia. In Australia students were informed of the study through announcements on the Moodle on-line course management system (Blackboard) with links to the on-line form, and in Malaysia the study was announced at the end of classes.

Participants took an average of 15 minutes to complete the survey.

Data Analysis

Following data entry and cleaning, the analysis occurred in three steps. First, a principal component analysis (PCA) of the data from the initial 19-item pool was conducted, and a scree plot used to estimate the underlying dimensionality of the data. Second, the reliability of the scale was examined. Finally, the validity of the scale was examined for construct and convergent validity (228).

The statistical procedures were conducted in the R statistical environment (224).

Results

Principal Component Analysis

Five components emerged from the PCA with eigenvalues greater than unity. An examination of the scree plot, however, showed a clear "elbow" at the second component indicating a single component solution. The first component accounted for approximately 22% of the variance (eigenvalue = 4.09) (See Figure 6). The combination of the other four components would have contributed an additional 16% of the variance, which supported the single component solution. Individual items with loadings greater than 0.4 on a factor were retained (192,242), producing an 8-item scale(Table 5). The correlation between the full 19-item scale and the 8-item scale was very high ($r = .94$, $p < .01$)

Figure 6: Scree plot of the 19-item questionnaire

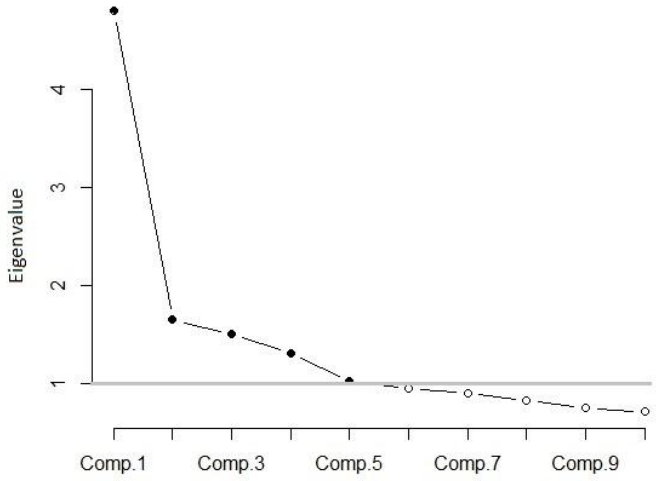


Table 5: Factor loadings of the final 8-item scale

Item Nr.	Items	Loadings
	Factor 1 (Professional view and attitude towards HIV infectivity)	
1	A colleague working as a pharmacist in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive pharmacist should have her/his position terminated.	0.68
2	A colleague working as a doctor in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive Doctor should have her/his position terminated.	0.77
3	A colleague working as a nurse in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive nurse should have her/his position terminated.	0.80
4	Physicians with HIV should be allowed to continue working.	0.64
5	Pharmacists with HIV should be allowed to continue working	0.68
6	Surgeons with HIV should be allowed to continue working	0.50
7	A hospital has implemented a policy of mandatory testing for HIV at recruitment of its cleaning staff.	0.41
8	In general it would be better if HIV positive patients were treated in facilities separate from other patients.	0.46

Reliability

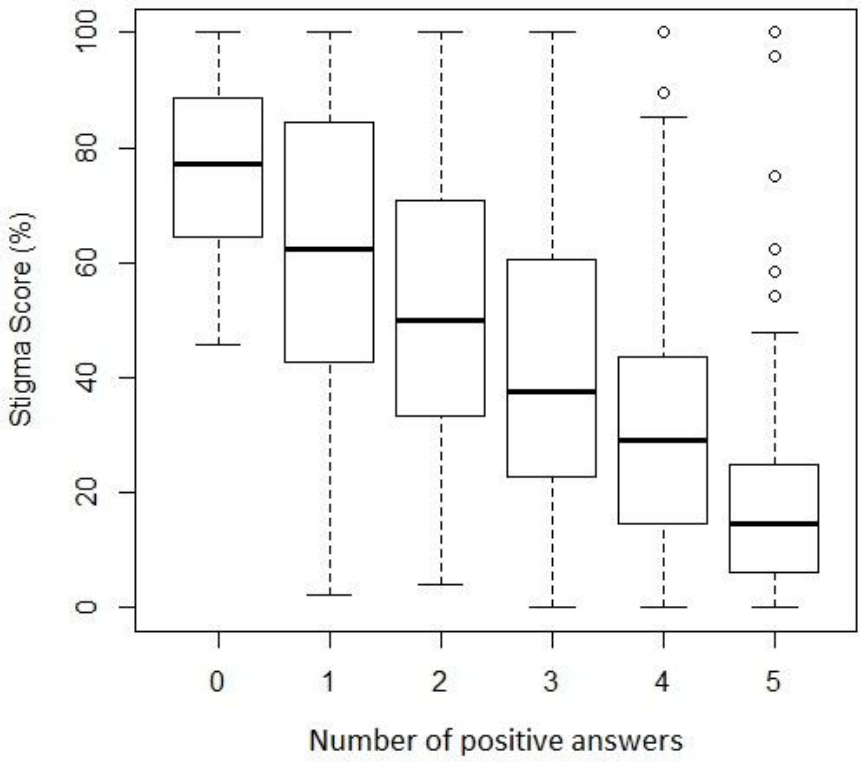
The internal consistency was evaluated with Cronbach's alpha (243) for the initial 19-item questionnaire (α=*.81*) and the final 8-item scale (α=*.83*). Alpha for both scales reflected a good inter-item homogeneity (244). Cronbach's alpha is favored because of its efficiency in producing the mean of all possible split-half reliabilities (190).

Validity

The convergent validity of the 8-item scale was established by examining the relationship between it and five independent "yes-no" questions asking about attitudes towards people living with HIV/AIDS. The 8-item stigma score resulting from the PCA was rescaled from 0 to 100, to reflect the percentage of the scale maximum, where 100 indicated the highest possible level of stigmatizing attitudes,

and 0 represented the lowest possible level. Respondents were grouped by the number of positive answers provided to the convergent validity questions. This resulted in 6-groups of respondents from those showing only positive attitudes (i.e., providing answers indicating positive attitude to all of the 5 questions) to those showing only negative attitudes (i.e., providing answers indicating no positive attitudes on all 5 questions). The monotonically, decreasing, relationship between stigma score (%) and number of positive attitude answers supports the convergent validity of the scale (Figure 7).

Figure 7: Convergent validity of the final 8-item scale



Discussion

There is a need to develop and validate HIV/AIDS-related stigma scales, so that future studies using them are able to report findings that are operationally and conceptually consistent (240). This study, describes the development, validity and reliability testing of a new HIV/AIDS stigma scale for use among health professionals.

The results of the PCA produced an 8-item, reliable scale with good face and convergent validity. One component emerged from the analysis: Professional view and attitude towards HIV infectivity. This component was highly and positively correlated with the initial 19-item questionnaire, suggesting preliminary evidence that the new scale may be a viable tool for measuring HIV/AIDS stigma among health professionals (in training).

The respondents reported their attitude based on three elements: (i) their knowledge of HIV transmission; (ii) the fear of HIV contagion; (iii) the risk of HIV transmission by an infected colleague or worker in a health working environment. These three elements complement one another and clearly the "HIV/AIDS knowledge" is the main constituent of the three elements. Though the literature on knowledge of HIV/AIDS and its association with attitudes towards PLWHA is conflicting, (83,239,245) in this study we found that non-stigmatizing attitudes were positively associated with HIV/AIDS knowledge. Similar to some studies (83,239,246), those healthcare students who understood the HIV/AIDS pathophysiology and modes of its transmission reported a less stigmatizing attitude towards their infected peers in a healthcare environment.

Fear of contagion has been identified as one of the dimensions of fear of AIDS in health professionals (183). It is shown that the fear of casual contagion and the fear of occupational exposure are associated with the stigmatizing attitudes of healthcare professionals (239,247).

Interestingly, this fear is associated with an increased personal as well as public social distancing, and is said to be mainly due to anxiety about the infection (183). Moreover, this fear is said to be correlated with the type and closeness of interaction with patients (183). The findings of this study, suggest that the fear of contagion may also be associated with the increased professional distancing not necessarily because healthcare students stigmatize HIV positive individual but due to their apprehension about contracting HIV.

It is evident that a better understanding of the routes as well as the risks of transmission of HIV in a healthcare environment may result in more positive attitudes towards PLWHA. The three elements reported here are the determinant of a professional view on HIV/AIDS and HIV/AIDS-related stigma.

Limitations

An inherent problem with these kinds of scales is the mapping of attitudes to behavior, where a respondent's self-reported attitude may not be congruent with current or future behavior. An important step in the future validation of the scale would be a behavioral analysis of healthcare professionals. A second limitation, again common in this kind of research, relates to the limited respondent pool from which participants were drawn. The generalizability of the scale needs to be established in healthcare professionals (and healthcare professionals in training).

Conclusion

This study lays the foundation for further investigation into the relationship between HIV related stigmatization and professionalization of [future] healthcare deliverers. Although these findings suggest that the final 8-item scale had acceptable psychometric properties and allowed the identification of HIV/AIDS-related stigma among the study population, the generalizability is yet to be established.

3.4.1 Appendix

Table 6: The 19-item questionnaire

Item No.	Item	Answer category
	If HIV/AIDS patient attends a busy Accident and Emergency, a doctor should be able to choose to treat another patient instead.	**Agree strongly** ☐ **1** ☐ **2** ☐ **3** **Neither Agree nor disagree** ☐ **4** ☐ **5** ☐ **6** **Disagree strongly** ☐ **7**
2	A doctor could refuse to treat a patient with HIV/AIDS to protect him/herself from contracting HIV/AIDS.	☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7**
3	A doctor should wear gloves to measure height and weight of HIV/AIDS patient.	☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7**
4	A HIV positive patient is admitted on to a general medical ward. A colleague suggests that the patient's bed should be marked in a way that the HIV status was easily recognisable by staff (but not by other patients).	☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7**
5	A colleague working as a pharmacist in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive pharmacist should have her/his position terminated.	☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7**
6	In general it would be better if HIV positive patients were treated in facilities separate from other patients.	☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7**
7	A surgeon could refuse to operate on a patient with HIV/AIDS to protect him/herself from contracting HIV/AIDS.	☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7**
8	A colleague working as a doctor in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive Doctor should have her/his position terminated.	☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7**
9	A pregnant nurse refuses to give an injection to HIV/AIDS patient and asks her colleague instead to give the injection.	☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7**
10	Surgeons with HIV should be allowed to continue working.	☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7**

11	A hospital has implemented a policy of mandatory testing for HIV at recruitment of its healthcare workers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
12	A colleague working as a nurse in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive nurse should have her/his position terminated.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
13	Physicians with HIV should be allowed to continue working.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
14	Pharmacists with HIV should be allowed to continue working.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
15	A hospital has implemented a policy of mandatory testing for HIV at recruitment of its cleaning staff.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
16	While working in a ward you hear a colleague (doctor/pharmacist) passing a demeaning comment about HIV/AIDS patient without being heard by the patient. Do you think there is any harm in this?	**Definitely No** ☐ 1	☐ 2	☐ 3	**Undecided** ☐ 4	☐ 5	☐ 6	**Definitely YES** ☐ 7
17	While working in a ward you hear a colleague (doctor/pharmacist) passing a demeaning comment about HIV/AIDS patient without being heard by the patient. Would you criticise your colleague?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
18	While working in a ward you hear a colleague (doctor/pharmacist) passing a demeaning comment about HIV/AIDS patient without being heard by the patient. Would you report your colleague to his/her supervisor?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
19	The pathology laboratory returns test results showing that a patient is HIV positive, and the patient's spouse is HIV negative. Should the attending doctor inform the spouse?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Table 7: Independent "yes-no" questions asking about attitudes towards people living with HIV/AIDS

Question Nr.	Question	Answer indicating positive attitude
1	Is it necessary to take extra infection control precautions for patients with HIV/AIDS?	NO
2	Due to the training that health professional receive, is it easier for them to identify who has HIV simply by looking at the person?	NO
3	Would you continue to use the services of a dentist, if you learned that s/he provides dental care for patients with HIV/AIDS in her/his practice?	YES
4	Would you be concerned if you had to have a blood test in a laboratory that provides services to a lot of people with HIV/AIDS?	NO
5	Should a mother who has HIV/AIDS avoid physical contact with her child?	NO

Part III

Preamble

A key objective of this thesis is the exploration of bifurcation of HIV/AIDS-related stigmatizing attitudes in relation with professional development. It was hypothesized that "On average, healthcare students will evaluate disease – HIV/AIDS- in healthcare situation in a less stigmatizing fashion than disease in social/private situation." Generalized estimating equation (GEE) technique was used to test the above-said hypothesis. GEE method is a regression technique that is widely used to model the population-average estimates with clustered/ repeated measures data.

This section presents the inferences of employing this modeling technique in measuring the magnitude of relationship between *stigma* and the exploratory variables such as *gender*, *type* of stigma (*personal* view and *professional* view), *program* of study, *year* of study, *site* (campus), *knowledge*, interaction between *type and year*, and *type and program.*

3.5 Generalized Estimating Equation (GEE)

Introduction

Statistical models measure the approximate relationships between the variables (248–251). This patterned variation, is determined by the *systematic effects* as well as the *random effects* nested within data (249). Systemic effects are the hypothesized prediction of covariate-outcome associations, while the unexplained and haphazard variations –errors – in the data are referred to as random effects. In brief, a good model should be able to precisely represent the data in terms of both systemic effects and random effects (249).

In order to choose a suitable modeling technique one needs to acknowledge the distributional assumptions of the statistical models; and the distribution of estimation errors. These distributional assumptions describe the variability in a data set (249). Once the modeling technique is determined, the next step is to conscribe the best fit model produced by the prescribed modeling approach, which is parsimonious and best describes the magnitude of covariates' relationships. A good model not only describes the variation in the data; but it should also portray the patterns of systemic effects in similar datasets (249,250).

Generalized estimating equation (GEE) was introduced for the regression analysis of clustered observations by Liang and Zeger (252). GEE methodology is one of the available modeling techniques and is the expansion of the generalized linear model (GLM).[23] It provides a framework for the analyses of dichotomous and

[23] For more readings please refer to the following books:

1- ***Generalized linear models*** by McCullagh and Nelder (1989)

polytomous data with more relaxed assumptions of traditional regression models. (253,254)

GEE method is a commonly used approach to model the population-averaged estimates with correlated data (252,253,255–258). Population average models – *marginal models* – describe the average populations' response to the variations of the dependent variable. These models portray, for example, the extent of population net change for every one-unit increase/decrease in a covariate over individuals (254,259). Population average estimates are the functions of covariates and can be modeled without assumptions about the heterogeneousness over subjects. Here, the covariate estimate explains the relationship with the dependent variable without distinguishing between observations belonging to the same or different individuals (255).

GEE method requires fewer distributional assumptions than other modeling techniques for correlated data; hence, it generates unbiased population-averaged estimates – marginal expectations – that are more robust than the subject-specific models (253,260). Moreover, the statistical conclusions derived from GEE methodology are more robust and more applicable when the dependent variable is highly correlated within subjects (254).

GEE approach robustly accounts for the dependency or correlation between the repeated measures while calculating the population-averaged estimates. This

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2- ***Analysis of longitudinal data*** by Diggle, Heagerty, Liang and Zeger (2002)

3- ***An introduction to generalized linear models*** by Dobson and Barnett (2008)

4- ***Generalized linear models and extensions*** by Hardin and Hilbe (2012)

correlation is modeled via different *working* correlation matrices. *Correlation matrix* is the vector of repeated measure between individuals; and contributes to the assessment of parameter estimates in clustered (correlated) data (254).

Correlation matrix models the dependence of each observation with other observations in the same cluster (261). Specifications of working correlation matrix is an integral part of regression analysis (252,253,255–257,260). In GEE modeling, correlation matrix is estimated from the residuals that are created from the *observed-predicted* model (255). Therefore, this is the working correlation that helps the GEE models to estimate the correlated observations (238,240).

There are several possible working correlation structures for GEE users. Each of these structures has its own pre-defined specification that helps in better estimation of parameter estimates (254). Usually misspecifications can affect the exactness of covariate estimates and eventually the variation in the data (254). Even with misspecification of the working correlation matrix the GEE method is able to reasonably model the covariates' relationships (252,253,255–257,260). These consistent estimates are robust approximation of the variance of the estimates that can reset the correlation matrix in marginal models(254,262–264).

Some of the working correlation structures such as *'independent'*; *'exchangeable'*; *'unstructured'*; *'autoregressive'* are incorporated in some statistical packages (254,255,262,263). *'Exchangeable'* working correlation structure proposes an equal correlation between the observations over individuals. In this correlation form, there is no hierarchical arrangement for observations within a cluster (254,255)

An *'independent'* correlation structure assumes a zero correlations between the observations within the subjects (254,255). This approach is widely applied to model the ordered multinomial repeated measures (254). From its name *'unstructured'* correlation assumes unconstrained and all possible correlations between within-subject responses, which allows free estimation of parameter estimates over study subjects (254,255). An *'autoregressive'* correlation structure assumes a correlation within- subject response over a lag period; where observations are only related to their own past values in an ordered fashion (254,255).

Once the decision is made on the most appropriate working correlation structure to model the data, the next step is to develop the GEE models by adding covariates and covariates interaction(s) (265). The addition of covariates, predictors, and their interaction forms to a model are, and should be, theory-driven (265). The ultimate goal is to find a model that a) fits the data; and b) makes the most theoretical sense out of the data (254,266).

The process of model selection in GEE is handled using '*Quasi-likelihood under the independence model criterion*' (QIC) (254,267,268). GEE is non-likelihood estimation based because in marginal models the observations are correlated and non-independent from each other as are the residuals, hence the common [maximum] likelihood-based methods are redefined as quasi-likelihood estimation based (254,265). A model with a smaller QIC value indicates a better fit to the data (260).

RESULTS (Study I)[24]

[24] Parts of this chapter is submitted as an article to the **Teaching and Learning in Medicine** journal with ISSN: 1040-1334 (print). The article is under review. To view the submitted article please refer to **Appendix I** on page 211.

"The health of my patient will be my first consideration."

World Medical Association (Declaration of Geneva)

4.1 Preamble

A key objective of this thesis is the exploration of the "bifurcation" of HIV/AIDS-related stigmatizing attitude in relation to professional development. It was hypothesized that:

a) On average, healthcare students will evaluate disease –HIV/AIDS- in healthcare situation in a less stigmatizing fashion than disease in social/private situation.

b) On average, the level of HIV/AIDS related professional stigma would decline more rapidly over the years of study than would the level of HIV/AIDS related personal stigma.

Generalized estimating equation (GEE) technique was used to test the above-said hypotheses. GEE method is a regression technique that is widely used to model the population-average estimates with clustered data. We were interested in measuring the population-averaged estimates i.e., the stigmatizing attitudes of healthcare students; and not in the stigmatizing attitudes of student A or student B. Therefore, we employed the GEE method to model our findings.

In GEE methodology the likelihood does not exist and the residuals are correlated within a cluster (266). The likelihood estimates assess the adequacy of a fitted model if the residuals are uncorrelated (266). Hence other approaches have been suggested to test for the goodness-of-fit tests for models developed by GEE approach. These tests are more robust and form statistical scores that are asymptotically distributed (266).

This section presents the inferences of employing this modeling technique in measuring the magnitude of relationship between stigma and the exploratory variables such as gender, type of stigma (personal view and professional view), program of study, year of study, site (campus), knowledge, interaction between type and year, and type and program.

4.2 A cross-sectional study of the bifurcation of social attitudes of healthcare students in one institution.

4.2.1 Introduction

As healthcare students progress through their course and become more professionalized (38,61,62); they acquire knowledge and self-reflective capacities. Such skills should enable the [future] health professionals to cope with uncertainties, including non-routinized and conflicted situations of practice (63). However, some 'health professionals' may not be able to cope with uncertainties or conflicted situations of practice as their social attitudes may branch off between professional/ethical duties and personal moral convictions (59,269).

The idea that the social attitudes of healthcare students may branch off between personal domain and professional domain, could be explained by looking at the profession from a social point of view and observing the process of professionalization from a psychological point of view in the context of learning. Education is a process of "norm acquisition" (142) in relation with moral mandates;(143)as one learns more about the norms of health profession – code of ethics and professional conducts – and continually tries to justify – cognitively involved with – the moral values of the new norms; eventually a disharmony may be created.

Culturally-sanctioned and approved attitudes learned earlier might create a dissonance with more recently learnt attitudes – health ethics and professional code of conducts. HIV/AIDS is a classic example. A healthcare professionals may hold negative attitudes towards PLWHA, but s/he has learnt to be blind to the personal

characteristics of the patients within a professional context and to provide a standard package of care.[25]

It is hypothesized that:

- On average the level of HIV/AIDS related stigma would decline with the increasing years of study –professional development.

- On average the level of HIV/AIDS related professional stigma would decline more rapidly over the years of study than would the level of HIV/AIDS related personal stigma.

It is also hypothesized that the association would hold even after controlling for the healthcare program and the individual knowledge about HIV. The hypotheses were tested using cross sectional survey data.

Generalized estimating equation (GEE) techniques were used to describe the average healthcare students' responses to HIV/AIDS-related stigmatizing attitudes.

4.3 Methods

4.3.1 Participants

Five hundred and eighty nine (589) medical students and 218 pharmacy students (N=807) studying at Monash University campuses in Malaysia and Australia participated in the present study from all years of the degree program i.e., four years in Pharmacy and five years in Medicine.

[25] For detailed discussion please refer to **2.3. Theoretical and conceptual framework** on page 16.

73% of the participants were medical students and 27% were pharmacy students. Sixty-two percent (62%) of the students were female (n=500, mean age=21.2, SD=2.46) and 38% were male (n=307, mean age=21.1, SD=2.11).

More than two third of the participants were from the Monash Malaysian campuses (66.4%) and the remaining were from the Monash Australian campuses (33.6%).

On average 25% of the total participants were in their first year of their undergraduate programs; less than 23% were in their second year; almost 25% were in their third year; 23% were in their fourth year; and 9% of the total participants were the final year medical students. (See Table 8)

The small numbers of 5th year medical students participating in the study reflected the nature of the program. In the final year of medicine students are spread across a large number of hospitals and they are harder to contact and less responsive.

Table 8 Description of the study population

		Program	
		Medicine	**Pharmacy**
Age		Mean age = **21.2** yrs, SD = **2.5**	Mean age= **20.8** yrs, SD= **2.1**
Gender			
	Male	**252** (31.2%)	**55** (6.8%)
	Female	**337** (41.8%)	**163** (20.2%)
Site			
	Malaysia	**369** (45.7%)	**167** (20.7%)
	Australia	**220** (27.3%)	**51** (6.3%)
Year			
	Year 1	**137** (23%)	**59** (27%)
	Year 2	**105** (18%)	**60** (27.5%)
	Year 3	**156** (27%)	**48** (22%)
	Year 4	**137** (23%)	**51** (23.5%)
	Year 5	**54** (9%)	**Not applicable**

Note.- Total number N = 807

4.3.2 Materials

A questionnaire was distributed that contained (i) demographic questions, (ii) the validated scale for measuring HIV/AIDS related stigmatizing attitudes from a professional perspective (iii) the validated scale for measuring HIV/AIDS related stigmatizing attitudes from a personal perspective and (iv) the validated scale for measuring attitudinal knowledge of HIV transmission.

The stigma scales operationalized stigma as an unwillingness to interact with PLWHA or to provide care to them. A high score represented “no HIV/AIDS-related stigmatizing attitude” and a low score represented “high levels of HIV/AIDS-related stigmatizing attitude”. Without repeating the validation of the scales in detail it is worth noting that the professional stigma scale had a Cronbach's alpha of 0.83, the private stigma scale had an alpha of 0.89, and the attitudinal knowledge scale had an alpha of 0.66.

Refer to the previous chapters to revisit the information on the development, reliability and validity testing of the survey questionnaire.

4.3.3 Outcome

The outcome measure was the measures of HIV/AIDS-related stigmatizing attitude (personal and professional). Because each participant contributed one personal measure and one professional measure, it was in effect a repeated measure of HIV/AIDS-related stigmatizing attitudes within each participant. To ensure that the attitudes were measured on the same metric, the stigma measures were rescaled to z-scores; i.e., they each had a mean of zero and a standard deviation of 1 (270). This allowed us to assess differences in levels of stigmatizing attitudes in standard deviation (SD) units.

4.3.4 Predictor

One of the predictors was the professional development that was operationalized in terms of years of study in a professional healthcare program. The other predictor was the context in which the HIV-AIDS related stigma occurred. That is, the attitudes of healthcare students towards people living with HIV/AIDS (PLWHA) in the context of working environment in a healthcare setting, referred to as professional stigma; and the attitudes of healthcare students towards PLWHA in a private situation referred to as personal stigma.

4.3.5 Covariates

The covariates in the analyses were the participant's gender, and their level of HIV knowledge. Other covariates that were added to the models were the healthcare program (pharmacy vs. medicine), and the university site (Malaysia vs. Australia), and type of stigma (personal vs. professional) and their functional form i.e., interaction between "type x year" and "type x program".

Analyses comprised three steps. First, bivariate association analysis was performed to determine the relative size of correlation between the dependent variable i.e., stigma and the covariates. Second, multivariate regression analysis was carried out using GEE to develop four regression models. The models contained covariates, predictor and the functional forms of the covariates. The inclusion and step-wise addition of the predictor, covariates and their interactions to develop models were theory-driven, based on the hypotheses of this research. Third, the adequacy of fitted models was tested to determine the best model that had the best fit for the data based on the Quasi-likelihood under the independence model criterion (QIC) (265). This approach is more robust and forms statistical scores that are asymptotically distributed (266).

Four multivariable regression models (271) were estimated using GEE method integrated with 'exchangeable' correlation structure. These models focused on the effects of predictor, covariates and their interaction effects on stigma. Model 1 (Base model) was developed with the following covariates: knowledge; program; site; and gender. It was hypothesized that on average HIV/AIDS-related stigma would decline with increasing professional development. Model 1 (Base model) was used to explore the effects of covariates on stigma in the absence of the time effect associated with professionalism, or the type of program. It provided the basic model with which the other models were compared.

Model 2 extended the Base model by the predictor i.e., year and the covariate i.e., type. It was hypothesized that a) on average HIV/AIDS- related stigmatizing attitudes would decline as the healthcare students become more professionalized; b) as professional development ensues, types of HIV/AIDS-related stigmatizing

attitudes (Professional vs. Personal) would decline at a different rate i.e., HIV/AIDS-related professional stigma would decline more rapidly than the HIV/AIDS-related personal stigma. Years spent in a health program could reasonably be a good indicator of professional development (201). Type was another added covariate as it was also hypothesized that the stigmatizing attitude could be associated with the environment of encounter with PLWHA. The professional ethics and code of conducts provide a "To-Do list" to the [future] health professionals about the perspectives of encounter with PLWHA in healthcare settings, but these ethics packages do not instruct the [future] health professionals on how they should perceive PLWHA from a personal point of view. Hence, type was added to estimate the magnitude of correlation between the stigmatizing attitude and the healthcare students' view (either professional or personal) about PLWHA.

Model 3 was established by the addition of another covariate i.e., the interaction between type and year to Model 2. It was hypothesized that "On average level of HIV/AIDS related professional stigma would decline more rapidly over the years of study than would the level of HIV/AIDS related personal stigma." During the course of professional development, the trainees gradually receive a complementary set of routines at each point. These routines and norms of a profession include periodically cumulative sets of ethics and code of professional conduct (38). Thus, by spending more time in a professional [health] course, one is expected to become more professionalized. The interaction between type and year represents the professional view on the stigmatizing attitudes towards PLWHA as the healthcare students periodically obtain knowledge, skills and expertise and become more professionalized.

Finally Model 4, the fourth regression model, was developed by including the time-independent covariate "type and program" into Model 3. Reference is made to the hypothesis that "On average level of HIV/AIDS related professional stigma would decline more rapidly over the years of study than would the level of HIV/AIDS related personal stigma." The professional view on HIV/AIDS-related stigma could be associated with the description of professional [health] courses and their syllabi, because the code of ethics and professional conduct are tailored to the nature of the job and duties expected of the professionals (38). Moreover, HIV/AIDS-related stigmatizing attitudes are associated with type and closeness of interaction with patients (183). Although a personal view could affect a professional view and vice versa (136); it is argued that the change in the stigmatizing attitude in the personal domain is less associated with professionalization, compared with the change in the professional stigmatizing view (201). Therefore, the Interaction between type and program was added to Model 4.

The goodness-of-fit of each of the four regression models was tested using Quasi-likelihood under the independence model criterion (QIC). In addition, visual estimation method was also –carried out by eyeballing through 'residual plots'- in selecting the Model. (See page 119) Finally, the selected Model's prediction adequacy was further evaluated by regressing the predicted (modeled) values against the observed values (272).

4.3.6 Statistical Analysis

The modeling was carried out using the geepack package (224,262,263) and the model selection tests were performed using the MuMIn package (273). These [add on] packages are included in the R statistical software environment. R is a free

programming software for computation and graphics and its packages are also freely available from www.r-project.org (224,262,263).

HIV/AIDS-related stigmatizing attitude – the repeated measure in this study – hereinafter is referred to as "stigma" was the dependent variable. For each participant a professional and a personal stigma score was calculated. Stigma was operationalized in terms of unwillingness to have interaction with PLWHA or to provide care to them from two different prospects: 1) personal view; 2) professional view.

Covariates i.e., knowledge, program (pharmacy vs. medicine), site (Malaysia vs. Australia), gender, year [of study] and type of stigma (personal vs. professional) and their functional form i.e., interaction between "type and year" and "type and program" were modeled via "exchangeable" working correlation matrix.

4.4 Results

Results of bivariate analyses of the relationship of stigma, knowledge, program, site, gender, year [of the study] and type [personal and professional view] of HIV/AIDS-related stigmatizing attitudes are presented in Table 9. Stigma was affected positively – decreased – by all of the covariates and the predictor. Except gender, the covariates and the predictor had a statistically significant effect on stigma. For instance, knowledge and year[s] spent in a program (either pharmacy or medicine) significantly reduced the stigma (0.20, $p<.001$ and 0.16 $p<.001$). Of all covariates, maximum reduction in stigma was associated with program and site (0.51, $p<.001$ and 0.29, $p<.001$) respectively.

Table 9 Bivariate analysis of the relationship between stigma and covariates

Variable	Stigma			
	β[1]	SE[2]	p	95% CI[3]
Covariates:				
Knowledge	**-0.20*** **	0.022	<.001	-0.24 – -0.16
Program (base=pharmacy)	**-0.51*** **	0.067	<.001	-0.64 – -0.38
Site (base=Malaysia)	**-0.29*** **	0.070	<.001	-0.42 – -0.16
Gender (base=Female)	-0.02	0.061	0.95	-0.10 – 0.14
Predictors:				
Year (base=First year)	**-0.16*** **	0.023	<.001	-0.20 – -0.12
Type (base=Personal)	**-0.14*** **	0.030	<.001	-0.20 – -0.08

*1- Parameter estimate coefficient, 2- [Robust] Standard Error, 3- Confidence interval, *** p <.001*

Expanding upon the outcomes from the bivariate analyses four multivariable marginal models were developed (See Table 10).

Model 1 (Base model) shows the estimation of stigma accounted for by knowledge, program, site and gender. The results are consistent with the bivariate analyses and show significant associations with stigma. This trend was similar across all models. Moreover, gender had a small and non-significant effect on stigma similar to the result of bivariate analyses. Visual presentation of Base model shows that male Malaysian medical students had a less stigmatizing attitude compared with male Malaysian pharmacy students. (See Figure 8)

Confirming the results of bivariate analyses in Model 1 all of the covariates except the gender had a significant effect on stigma. Multivariable analysis revealed smaller effects except for the covariate 'type'. For instance, the size of moderating effect of program in bivariate analysis was reduced from 0.51 to 0.34 in Model 1. Type showed a significant effect similar to that of bivariate analysis on stigma. The effect size of type [personal view and professional view] of stigmatizing attitude was invariable at -0.14 in bivariate analysis as well as the multivariable analysis. Visual presentation of Model 1 shows less professional stigmatizing attitudes compared with the personal stigmatizing attitudes in male Malaysian medical and pharmacy students. (See Figure 8)

'Year' had a significant moderating effect on stigma in Model 2. Although the size of effect was smaller compared with the bivariate analysis, for every year spent in the programs the stigmatizing attitudes decreased by 0.13 standard deviation.

4.4.1 Bifurcation of HIV/AIDS-related stigmatizing attitudes

Visual presentation of Model 3 and Model 4 shows the bifurcation of social attitudes over the years (See Figure 8). The interaction between type and year is significantly associated with stigma in Model 3 and Model 4. Moreover, the effect size of type and year covariate is similar in both models. In Models 3 and 4 the assumption of random errors being independent is not rejected as their residual plots display the mean of zero (See Figure 9). As expected, Models 3 and 4 portrayed the concept of dual loyalty (52,57) and confirmed the bifurcation of social attitude hypothesis proposed by Ahmadi et al (201). (See Figure 8, Model 3 and 4) Whilst the covariate 'type' was significantly associated with stigma in Model 2 and Model 3, it was non-significant in Model 4. Moreover, in Model 4 the interaction between type and program had a small effect and a non-significant association with stigma.

The goodness-of-fit of models was tested using Quasi-likelihood under the independence model criterion (QIC) and visual inspection of 'residual plots'. The smaller the QIC better, the model fit (265).The residual plots with no pattern – random pattern – supports the correctness of the model (274). The mean of residuals were zero in Model 2; Model 3; and Model 4. (See Figure 9) Following the rule of parsimony, Model 3 was selected.

Eventually, the prediction adequacy of the fit model i.e., Model 3 was further evaluated by comparison of Predicted values to Observed values (PO) (272). (See Figure 10) The predicted vs. observed regression values of personal stigma in medical program showed higher degree of similarity compared with the pharmacy program. Basically, Model 3 better predicted the personal view of HIV/AIDS-related stigmatizing attitudes in medical students compared with pharmacy students.

The higher degree of dissimilarity between the model predictions and the observed values amongst pharmacy students could be due to the noticeable decline in the observed stigma scores from year 2 to year 3. (See Figure 10) The observed values (of stigma) showed no changes from year 1 to year 2; with a slight decrease from year 3 to year 4. However, the observed values (of stigma) showed a steep slope marking a significant decline in the stigma score from year 2 to year 3. Whereas, the regressed predicted values would estimate a steady decline based on the effects of covariates; predictor i.e., year; and interaction i.e., type and year. The predicted vs. observed regression values of professional stigma in both medical program and pharmacy program showed high degrees of similarities. (See Figure 10)

Concisely, the model predictions are not significantly different from the observed values; confirming the performance of Model 3 in predicting the data well.

Table 10: Model estimates of stigma using GEE approach (multivariate analyses of stigma)

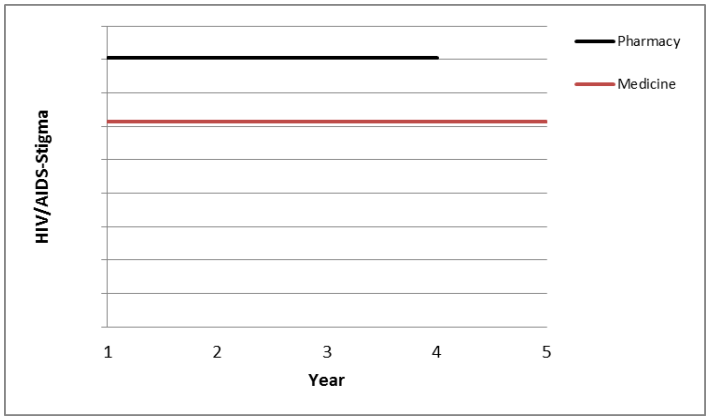
Variable	Stigma															
	Model 1 (Base Model)				Model 2				Model 3				Model 4			
	β[1]	SE[2]	95% CI	p	β[1]	SE[2]	95% CI	p	β[1]	SE[2]	95% CI	p	β[1]	SE[2]	95% CI	p
Covariates:																
Knowledge	**-0.16 *****	0.02	-0.20 – -0.16	<.001	**-0.14*****	0.02	-0.18 – -0.10	<.001	**-0.14*****	0.02	-0.18 – -0.10	<.001	**-0.14*****	0.02	-0.18 – -0.10	<.001
Program (base=pharmacy)	**-0.38 *****	0.07	-0.51 – -0.25	<.001	**-0.34*****	0.06	-0.45 – -0.23	<.001	**-0.35*****	0.07	-0.48 – -0.22	<.001	**-0.36****	0.07	-0.49 – -0.23	<.01
Site (base=Malaysia)	**-0.19****	0.07	-0.32 – -0.06	<.01	**-0.19****	0.06	-0.30 – -0.08	<.01	**-0.19*****	0.06	-0.30 – -0.08	<.001	**-0.19*****	0.06	-0.30 – -0.08	<.001
Gender (base=Male)	0.04	0.06	-0.07 – 0.15	0.49	0.02	0.06	-0.09 – 0.13	0.69	0.02	0.06	-0.09 – 0.13	0.69	0.02	0.06	-0.09 – 0.13	0.69
Predictors:																
Year	-	-	-		**-0.13*****	0.02	-0.17 – -0.09	<.001	**-0.07****	0.02	-0.11 – -0.03	<.01	**-0.07****	0.02	-0.11 – -0.03	<.01
Type (base=Personal)	-	-	-		**-0.14*****	0.03	-0.20 – -0.08	<.001	**0.12** ·	0.07	-0.01 – 0.25	<.1	0.05	0.14	-0.22 – 0.32	0.69
interactions:																
Type: year	-	-	-		-	-	-		**-0.10****	0.02	-0.14 – -0.06	<.01	**-0.10*****	0.02	-0.14 – -0.06	<.001
Type: program	-	-	-		-	-	-		-	-	-		0.04	0.07	-0.09 – 0.17	0.54
QIC[3]	-318				-373				-380				-379			

1-Parameter estimate coefficient, 2- [Robust] Standard Error, 3- Quasi-likelihood under the independence model criterion,

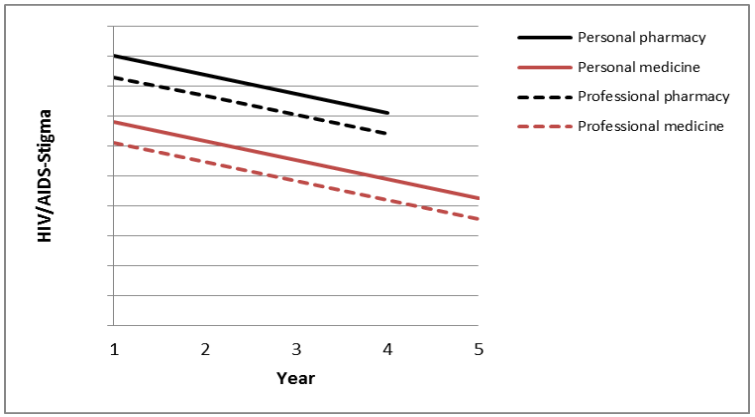
*** ρ <.001, ** ρ <.01, * ρ <.05, · ρ <.1

Figure 8: GEE Models

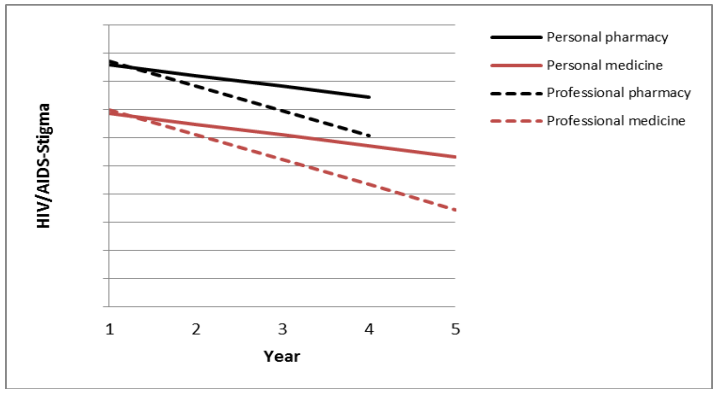
Model 1 (Base Model)



Model 2



Model 3



Model 4

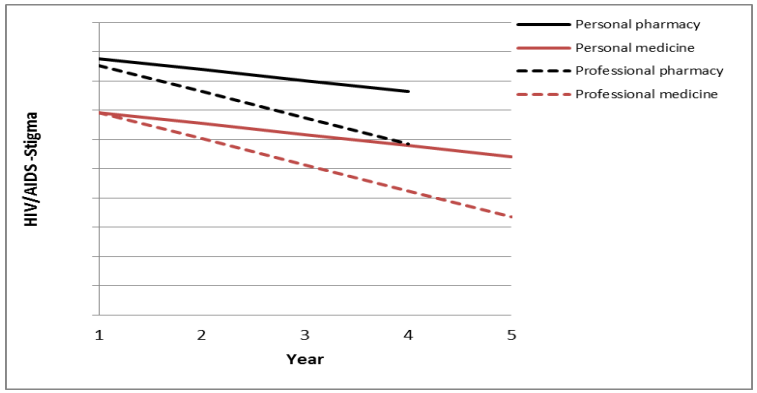


Figure 9: Residuals plot of each of the GEE Models

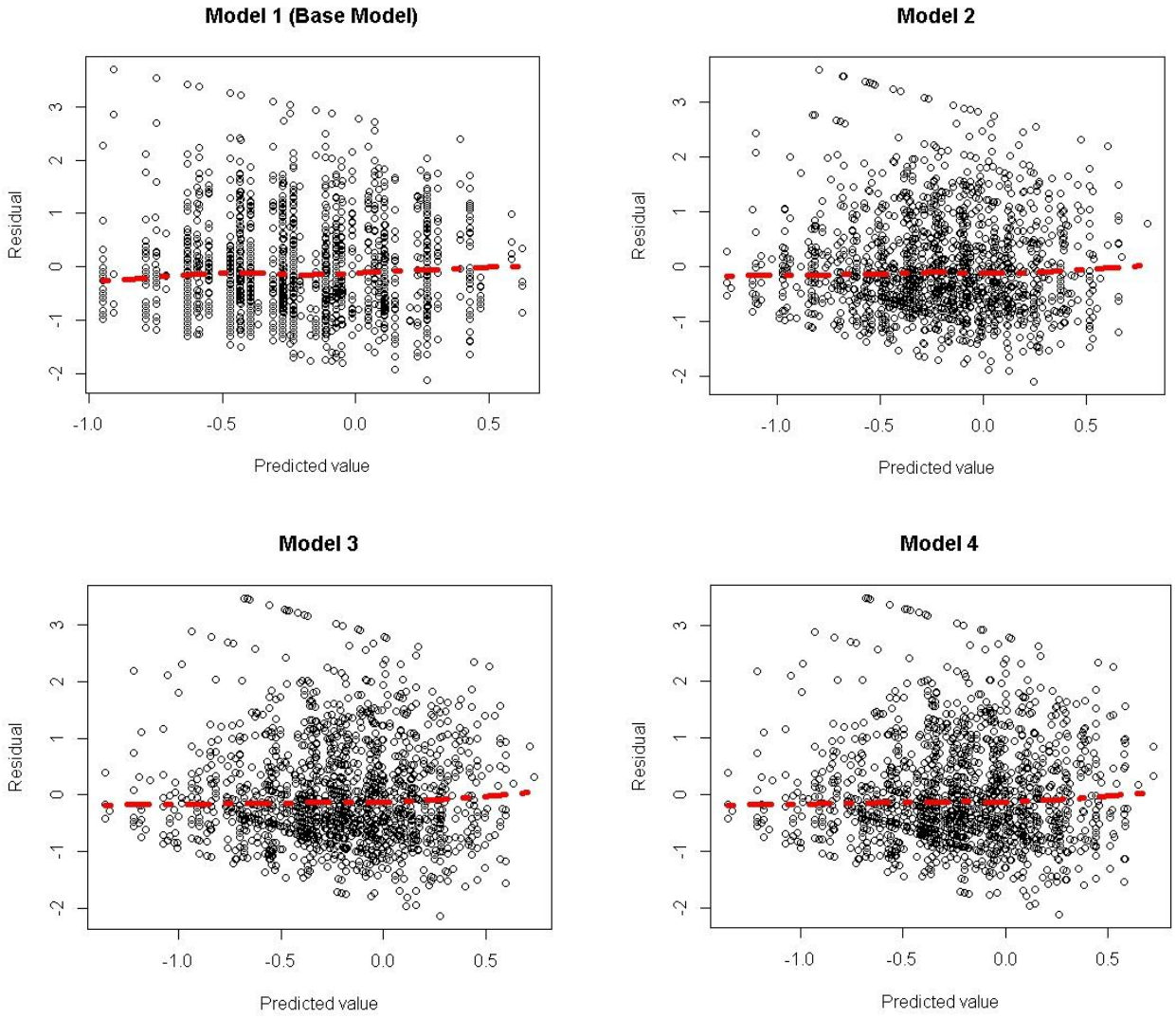
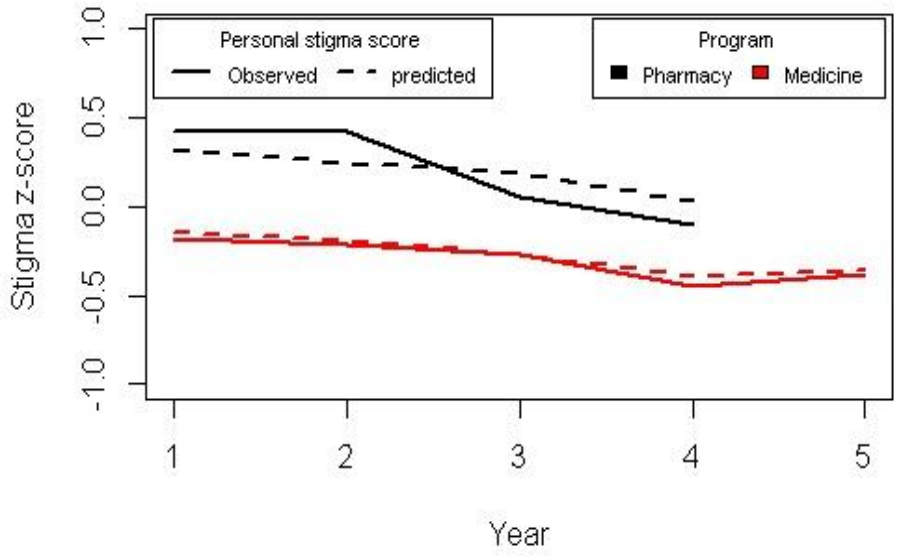
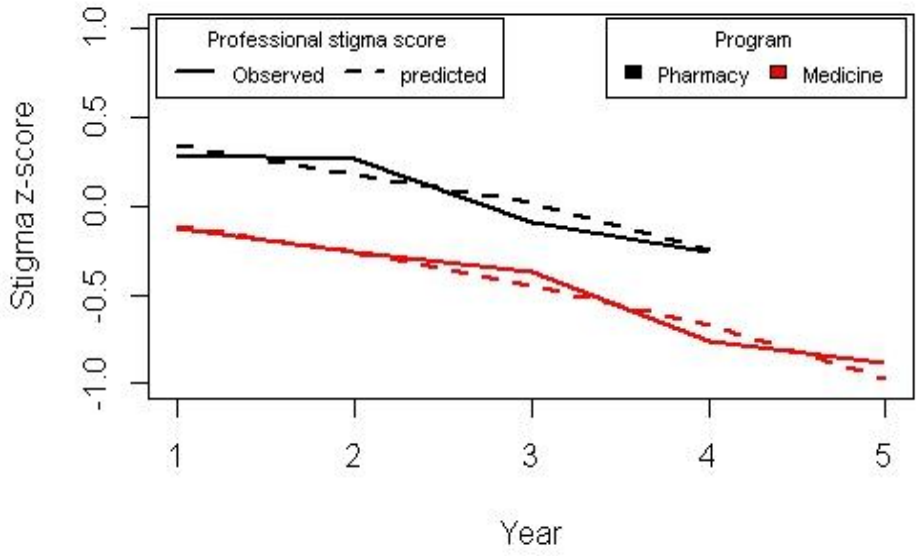


Figure 10: Predicted vs. Observed regressions derived from the GEE Model 3

Personal View



Professional View



4.5 Discussion

The findings are discussed according to three themes. First, we discuss the bifurcation of stigmatizing attitudes as one becomes more professional, by delving into the association between stigma and type i.e., domains of stigmatizing attitude (personal and professional). Second, we discuss the professionalization of stigmatizing attitudes by exploring the association between stigma and years spent in a health program; interaction between year and type; knowledge; program; and site. Finally, the discussion ends with an outline of methodological concerns and suggestion for future studies.

4.5.1 Bifurcation of stigmatizing attitudes:

The fundamental finding was the 'bifurcation' of HIV/AIDS-related stigmatizing attitudes amongst healthcare students. As healthcare students became more professionalized their HIV/AIDS-related stigmatizing attitudes diverge across two domains:

1- The professional domain in which the behavioral intentions towards PLWHA are work related in a health working environment.

2- The personal domain in which the behavioral intentions towards PLWHA are at personal levels and in private situations.

The HIV/AIDS-related stigmatizing attitudes, showed a significant –although small – decline for every year spent in the health programs i.e., pharmacy and medicine. The decline in the HIV/AIDS-related stigmatizing attitudes indicates the professionalization of HIV/AIDS stigmatizing attitudes amongst [future] healthcare professionals.

On average the HIV/AIDS stigmatizing attitudes in the professional domain declined faster than the HIV/AIDS stigmatizing attitudes in the personal domain. A steeper decline in the professional domain of stigmatizing attitudes, further, supports the professionalization of HIV/AIDS stigmatizing attitudes.

Our findings complement the current literature that HIV/AIDS-related stigmatizing attitudes are associated with knowledge, nature of professional training of different health professionals , social and cultural beliefs (35,201,239,246,275,276). For instance, in the Model, knowledge decreased the HIV/AIDS-related stigmatizing attitude significantly. The effect of knowledge on stigma also complements the discussion on professionalization of HIV/AIDS-related stigma.

4.5.2 Professionalization of stigmatizing attitudes:

A professional, however, is not simply brought into being. They are developed over time. When a student starts a healthcare professional course, they would not be steeped in the ideas of the profession. By the time they have finished their university training, they may not be a fully-fledged professional, but they will, we would anticipate, be more professional. In a course of [health] professional development, the apprenticed professionals pass specified selection points. At each point, for instance at the end of each year, they gradually introduced to a complementary set of routines (38). These routines include different competencies such as knowledge, skills, ethics of the service, etc. Hence, the ‘year’ could be a good predictor of professionalization. However, it is important to also consider the maturation, personal and ethical [human] development of students during the formative university years as one of the possible explanations of reduction in

stigmatizing attitudes (277); and not to merely attribute the reduction in stigmatizing attitudes to education and professional development.

As professional development occurs, the profession would demand from its professionals to select, improve, and prioritize the knowledge, the routines, and the capabilities. Hence the very basic strategy of being professional is to apply and operationalize all of the learned routines. Provision of standard and ethical care to HIV positive patients is one of the learned routines that results in reducing the HIV/AIDS-related stigmatizing attitudes as one becomes more professionalized. However, these routines may not affect deeply held personal morals.

'Site' (Malaysia vs. Australia) was significantly associated with stigma. Site may well reflect the contextual differences between Australia and Malaysia in the social constructs, cultural beliefs and perceptions of HIV/AIDS as a disease (96,275,278–280). The healthcare students of Australian campuses showed less stigmatizing attitudes compared with the Malaysian counterparts. We speculate that in Australia the HIV/AIDS-related social context, family assessment traditions, the interactional dynamics might have contributed to favorable and less stigmatizing attitudes of healthcare students towards PLWHA.

Different health programs train the healthcare professionals according to the job descriptions of that profession. The job description and the nature of interaction with PLWHA, significantly varies among healthcare professionals. It is shown that the fear of casual contagion and the fear of occupational exposure are associated with the stigmatizing attitudes of healthcare professionals (183,239,247). In the process of professional development, knowledge is increased by obtaining information and attaining skills and expertise. Hence, the knowledge seems to decrease the

stigmatizing attitudes as the increased personal and social distancing is mainly due to anxiety about the infection (183). In this study, on average the medical students showed significantly less stigmatizing attitudes compared with the pharmacy students. We speculate the difference is because of more knowledge and more clinical exposure –specially year 3,4 and 5- of medical students.

A profession is an occupation based on specialized training for the purpose of rendering ethical and specialized service(s) for a fee (61,62). Theoretical work on the professions in sociology acknowledges the wealth characteristics of professions but has looked more broadly at the social role of the professions (138). Most sociological works on professions highlight, in addition to the economic aspects, issues of ethics, standards and conduct (139).

From a healthcare point of view, becoming a professional is associated with healthcare professionals offering a standard package of interventions to all clients, and a concern with the protection of title, ethics and quality of practice, and job boundaries (139). A [future] healthcare professionals learns more about the norms of health profession i.e., code of ethics and professional conducts; and continually tries to justify the moral values of the newly acquired professional attitudes against the culturally-sanctioned personal attitudes. For instance, a [future] healthcare professionals may have learnt to disapprove of ‘homosexuality’ in a HIV positive person; but may have also learnt to provide an ethical and standard care to a HIV positive patient in a health setting.

When a future healthcare professionals is encumbered by his/her personal attitudes towards PLWHA, his/her professional attitudes might be periodically jettisoned to combat dissonance between the professional and the personal attitudes.

One could suggest that the bifurcation of the HIV/AIDS-related stigmatizing attitudes of [future] healthcare professionals is the aftermath of a mental juggling between the personal and the professional norms.

This research brings into stark focus a dilemma faced by many other professions required to provide close contact front line service to the public, in split of strong personal attitudes. Recent examples include, for instance, discussion of racism interfering with police practice in the US (281). The question is, therefore, could a concerted effort put into the process of professionalization during the training period help to address not only the practice –which is a competency based outcome of training, but also the personal attitudes of the practitioners?

4.6 Limitation

A plausible limitation with these kinds of scales is the mapping of attitudes to behavior, where a respondent's self-reported attitude may not be congruent with current or future behavior. An important step in the future research would be a behavioral analysis of healthcare professionals. A second limitation, again common in this kind of research, relates to the limited respondent pool from which participants were drawn. A third limitation is the magnitude of effects that appeared to be small, although they were statistically significant. The generalizability of these findings needs to be established in healthcare professionals (and healthcare professionals in training).

4.7 Conclusion

The key finding of this study was the idea of bifurcation of HIV/AIDS-related stigmatizing attitudes of [future] healthcare deliverers. This study eventually lays the foundation for further investigation into the professionalization of disease-

related social attitudes. Although these findings suggest that the GEE modeling techniques were successful in determining the association between stigma and other variables among study population, the generalizability is yet to be established.

RESULTS (Study II)[26]

[26] A 300 word abstract from the main findings of Study II was sent to the Monash University **Pharmacy Education Symposium 2015**, to be held at Monash University Prato Centre, Prato, Italy from July 5-8 2015. The abstract was accepted for oral presentation.

“I will NOT permit considerations of age, disease or disability, creed, ethnic origin, gender, nationality, political affiliation, race, sexual orientation, social standing or any other factor to intervene between my duty and my patient.”

World Medical Association (Declaration of Geneva)

5.1 Preamble

In the previous chapter we explored the "bifurcation" of HIV/AIDS-related stigmatizing attitudes in relation to professional development. We employed generalized estimating equation (GEE) technique to create a series of multivariable models; and we chose the best fitting model.

In this chapter we present the results obtained by comparing the levels of professional development of pharmacy students' in relation to their stigmatizing attitudes across two universities. We applied GEE techniques to our data set that contained the information on pharmacy students. The focus of this study was on a subgroup analysis of pharmacy students' professionalism by using HIV/AIDS-related stigmatizing attitudes as an indicator. The aim was to explore and compare the professionalization of students' social attitudes, conditioned on university. These data were obtained from the undergraduate pharmacy students at Monash University and Universiti Sains Malaysia (USM). To be able to interpret the findings and to rightfully contextualize the discussion of the key results, we provide a brief overview of the university and the pharmacy programs of the data collection sites.

We compared the HIV/AIDS-related stigmatizing attitudes among Monash University and USM students. We employed stratified multivariate [multivariable] GEE regression analyses for each university. Two GEE models i.e., Monash Model and USM Model were developed. The pattern of changes in stigmatizing attitudes of pharmacy students was different in each model. Monash pharmacy students showed less HIV/AIDS-related stigmatizing attitudes as they became more professionalized. In contrast, USM pharmacy students showed more HIV/AIDS-related stigmatizing attitudes as they became more professionalized.

We also explored the bifurcation of HIV/AIDS-related stigmatizing attitudes. The bifurcation of HIV/AIDS-related stigmatizing attitudes did not hold up in this data set. Subsequently, we have discussed the possible reason(s) as to why there were differences in stigmatizing attitudes of Monash and USM pharmacy students; and why the data did not show the bifurcation of stigmatizing attitudes.

5.2 HIV/AIDS related stigmatizing attitudes: A comparison between Monash university pharmacy students and Universiti Sains Malaysia (USM) pharmacy students.

5.2.1 Introduction

A health professional is expected to be blind to their patients' attitudes; and to provide equal treatment based on the clinical presentation. Pharmacists are no different from other health professionals (282). For instance, readiness to provide service, collegiality, truthfulness and respect are, to name a few, listed as the traits of a professional pharmacist in the pharmacy education literature, the professional codes of conduct and ethics, and the medical education literature (29,45,241,283–287).

The process of professionalization in pharmacy like other professional health programs, starts when the pharmacy students enroll in the pharmacy program; and in some universities, the pledge of professionalism is celebrated by attending the white coat ceremony (282,288,289). White coat ceremonies mark the entry of healthcare students into the health profession; and symbolize the beginning of professional socialization as an integral component of professionalism, while providing care to the members of the society (54,288,289). Healthcare students take the pledge of professionalism while wearing the white coat(288).

Professionalization is a continuous, challenging and purposeful process that needs specialized training (38,61,62). That is, attending the health courses for a prescribed period, to acquire the knowledge and the skills of the [pharmacy] profession (38,61,62). During the course of professional development, the health professions students are expected to develop their professional identity. The students gradually and periodically receive a cumulative sets of ethics and code of

professional conduct (38). Thus, by spending more time in a professional [health] course, one is expected to become more professionalized. The skills learned during the course of professional development should enable the [future] health professionals to provide care to all of their patients (63). However, some 'health professionals' may not be able to or may not want to provide care to certain group of patients e.g., a homosexual HIV positive patient. Their social attitudes may diverge between the professional/ethical duties i.e., provision of care to the patient and the personal views (269). Pharmacists are no exception, as the front-line clinical pharmacists are, now, directly involved with the – HIV positive – patients to perform their professional duties (290).

The professional duties of Pharmacists have constantly evolved (291). The evolution of pharmacy practice can be divided broadly between compounding, advising the prescribers, and eventually direct care. To explain the evolving responsibilities, we present a historical chronology of the job descriptions of pharmacists here. The traditional duties were compounding and preparing the prescribed medication(s) for the physicians. Physicians, then, explained the use of the compounded medications to the patients. The pharmacists had minimal contact with the patients (291). Following the period of 'compounding', the pharmacists became the advisors to the physicians by explaining the instructions on how to use or apply the sophisticated compounded medications; and eventually the pharmacists became directly involved with the patients to provide pharmaceutical care (291). Pharmaceutical care is the responsible provision of care to the patient in order to ensure the efficacy and safety of medications (292). The ultimate goal of

pharmaceutical care planning is to ensure the achievement of desired outcomes i.e., treating the disease(s) and increasing the patients' quality of life (292).

The progressive and evolving roles and responsibilities of pharmacists needed the pharmacy curricula to be continuously evolving to respond to the progressive demands of healthcare systems and the patients. As a consequence, the pharmacy curriculum needed major modifications to train the pharmacists to become qualified healthcare professionals pharmaceutically as well as clinically and to be directly involved in the provision care; and to interact with the patients (in the clinical settings) and the clients (in the community pharmacy outlets) (291–293).

Although, there are global policies on the standards of health professionals' ethical behavior (professionalism) (57), it is understood that the perception of professional attitudes and behavior vary by individuals, health institutions, health curricula, and universities (294). Hence, professional development is also likely to vary with the learning environment i.e., the university.

In this study, we recruited the undergraduate pharmacy students from two universities with different curricula i.e., 1) Universiti Sains Malaysia (USM) that has a pharmacy curriculum with a focus on pharmaceutical sciences, but includes some components of clinical pharmacy; 2) Monash University with a clinically-inclined pharmacy curriculum that puts a high premium on the management of disease from a clinical as well as a public health perspective (295).

Universiti Sains Malaysian (USM) is the second oldest Malaysian public university; and was established in 1969. USM is a research intensive university recognized by the Ministry of Higher Education Malaysia (MOHE); and has three

campuses i.e., Main campus; Engineering campus; and Health campus. The school of Pharmaceutical Sciences was established in 1972 as the first school of pharmacy in Malaysia. It is located on the main campus of USM. The school offers undergraduate as well as a wide range of postgraduate degrees. The undergraduate bachelor of pharmacy (B.Pharm) is a four-year course that has been revised several times to cater for the evolving pharmaceutical needs of the Malaysian healthcare sector. Although, claimed to have evolved to answer the needs to provide a more robust pharmaceutical care in the clinical settings, USM's undergraduate pharmacy program has retained its traditional pharmaceutical sciences components (296). One could argue that the B.Pharm course at USM is not as clinically-inclined as some other B.Pharm courses like the Monash University course. More information could be obtained from university's official website at: http://www.usm.my/index.php/en/

and http://www.pha.usm.my/index.php/kenali-ukkp/deans-welcome

Monash University is an Australian university; and is one of the members of the Group of Eight (Go8). Go8 is a coalition of 8 of the Australian research intensive universities with the aim to provide a platform for its members to work together effectively (297). Monash University has 5 campuses in Australia; one campus in Malaysia; a graduate school in China; a center in Italy; a research academy in India; and a campus in South Africa. Although Monash University is a public university its Malaysian campus is run as a private entity. The pharmacy curriculum and the entry requirements are identical in both Monash Australia and Monash Malaysia. The Monash undergraduate pharmacy course – a four-year program – emphasizes the development of clinical skills through professional placements in hospitals and community pharmacies. The Monash pharmacy curriculum is clinically oriented.

More information could be obtained from university's official website at: http://monash.edu/study/campuses/ and http://monash.edu/pharm/

Previously, It was hypothesized that:

1. On average the level of HIV/AIDS related stigma would decline with the increasing years of study –professional development.

2. On average level of HIV/AIDS related professional stigma would decline more rapidly over the years of study than would the level of HIV/AIDS related personal stigma.

We observed in the results of Study I from Monash University that the levels of HIV/AIDS related stigma had declined with the professional development. A question arises, therefore, whether there would be any differences in the levels of professionalism of Monash pharmacy students and USM pharmacy students in relation to HIV/AIDS-related stigmatizing attitudes; and if the hypothesized bifurcation of HIV/AIDS-related stigmatizing attitudes would be reflected.

To control for other variables such as culture and society; and to also hold the context we chose to compare the *Malaysian* pharmacy students of Monash University with USM.

5.3 Methods

5.3.1 Participants

Five hundred and eighteen (518) undergraduate pharmacy students participated in this study. Ninety eight (98) were from Monash University (mean age=21.9, SD=1.9) and 420 were students of Universiti Sains Malaysia (mean

age=21.3, SD=1.1). Participants were from all 4 years of the bachelor of pharmacy (B.Pharm) program.

Seventy-three percent (73%) of the participants were female (n=378) and 27% were male (n=140) students. All of the Monash participants were from the Monash Malaysian campus i.e., Sunway campus. In Malaysia we collected the responses using paper and pen. In the present study, less than one fifth of the participants were from Monash University (n=98). The small numbers of Monash pharmacy students mirrored the small size of student cohorts at Sunway campus compared with the larger numbers of pharmacy students at USM (n=420).

On average, less than 25% of the total participants were in their first year; 17.5% were in their second year; and almost 60% were in their third year and fourth year (See Table 11).

Table 11 Description of the study population

		University	
		Monash[1]	**USM**[2]
Age		Mean age = **21.9** yrs, SD = **1.9**	Mean age= **21.3** yrs, SD= **1.1**
Gender			
	Male	**24** (4.6%)	**116** (22.4%)
	Female	**74** (14.3%)	**304** (58.7%)
Site			
	Malaysia	**98** (18.9%)	**420** (81.1%)
	Australia	**0** (0.0%)	**Not applicable**
Year			
	Year 1	**15** (2.9%)	**108** (20.8%)
	Year 2	**9** (1.7%)	**82** (15.8%)
	Year 3	**41** (7.9%)	**108** (20.8%)
	Year 4	**33** (6.4%)	**122** (23.6%)

Note.- Total number N = 518
[1] *Sunway campus (Malaysian campus)*
[2] *Main campus in the Penang Island*

5.3.2 Materials

A survey was distributed to undergraduate pharmacy students of Monash University and Universiti Sains Malaysia (USM). The survey tool was identical to the one described in the previous chapter, except for the section of the tool that contained a knowledge scale. The questionnaire contained (i) demographic questions, (ii) the validated scale for measuring HIV/AIDS related stigmatizing attitudes from a [health] professional's viewpoint, (iii) the validated scale for measuring HIV/AIDS related stigmatizing attitudes from a personal viewpoint, and (iv) a validated scale for measuring knowledge of HIV transmission. (See page 2622 and page 2733)

The knowledge scale contained thirteen 'YES/No' questions. The answer categories were YES; No; and Don't know. Most of the knowledge scale questions were borrowed from validated measurement tools (298,299). (See Table 12) Every correct answer carried one point; and every incorrect response yielded no points.

“Don’t know” was scored as incorrect response. Hence, one could score a maximum of thirteen points and a minimum of zero on the knowledge scale.

The stigma scales operationalized stigma as willingness to interact with PLWHA or to provide care to them. A high score represented “no HIV/AIDS-related stigmatizing attitude” and a low score represented “HIV/AIDS-related stigmatizing attitude”. Without repeating the validation of the scales in detail it is worth noting that the professional stigma scale had a Cronbach's alpha of 0.83, the private stigma scale had a Cronbach’s alpha of 0.89, and the clinical knowledge scale had a Cronbach’s alpha of 0.60.

Table 12 The 13-item knowledge scale

Item Nr.	Item[a]	Response category		
		Yes	No	Don't know
1	Is there a difference between HIV and AIDS? †	☐	☐	☐
2	Can someone prevent getting HIV by abstaining from sex? †	☐	☐	☐
3	Can someone prevent getting HIV by remaining faithful to a faithful partner? †	☐	☐	☐
4	Can someone prevent getting HIV by always using condoms correctly? †	☐	☐	☐
5	Can HIV be transmitted from a mother to her baby during pregnancy? †	☐	☐	☐
6	Is there a cure for AIDS?	☐	☐	☐
7	Do you know of treatment that can prolong the life of people living with HIV/AIDS? †	☐	☐	
8	In a married couple, is it possible for one person to be HIV positive and the other one be HIV negative? †	☐	☐	☐
9	Can HIV be transmitted from a mother to her baby during delivery? †	☐	☐	☐
10	Can someone get HIV by sharing food with a person who is HIV positive?	☐	☐	☐
11	Is it possible for a healthy-looking person to be HIV positive? †	☐	☐	☐
12	Can HIV be transmitted from a mother to her baby by breastfeeding? †	☐	☐	☐
13	Can someone get HIV from mosquito bites?	☐	☐	☐

[a] *The correct answer to the questions marked with daggers (†) is "Yes", those without is "No". "Don't know" was scored as incorrect answer.*

5.3.3 Outcome

The outcome was the measures of stigma (personal and professional). Because each participant contributed one personal measure and one professional measure, it was in effect a repeated measure of HIV/AIDS-related stigmatizing attitudes within each participant. To ensure that the attitudes were measured on the same metric, the stigma measures were rescaled to z-scores; i.e., they each had a mean of zero and a standard deviation of 1 (270). The magnitudes of any group differences are scaled in standard deviation units.

5.3.4 Predictors

The predictors were the type of stigmatizing attitudes and the level of professionalization. Level of professional development was operationalized in terms of years of study in a professional healthcare program. The type of stigma was operationalized as personal and professional stigma. That is, the professional attitudes of healthcare students towards people living with HIV/AIDS (PLWHA) in the context of working environment in a healthcare setting; and their personal attitudes towards PLWHA in a personal situation.

5.3.5 Covariates

The covariates in the analyses were the participant's gender, and their level of HIV knowledge. Other covariates were the university (Monash vs. USM), and their functional form i.e., interaction between "type and year" and "type and university".

The analyses followed four steps. First, bivariate associations were examined to determine the magnitude of the statistically uncontrolled relationship between the dependent variable and the predictor and the covariates. Second, we used GEE method to develop two multivariable multivariate models. We carried out the

stratified GEE regressions to compare and contrast the effects of gender, knowledge, type, year and the interaction between year and type on stigma conditioned on university. The stratified regression aimed at testing whether or not the relationships between the variables were similar in Monash University and USM. We developed Monash Model and USM Model. In addition we also explored the bifurcation of stigmatizing attitudes in each of the models.

The focus of this study was on the subgroup analysis of pharmacy students' stigmatizing attitudes based on the findings of previous study (Study I). Results of 'Study I' showed the bifurcation of HIV/AIDS-related stigmatizing attitudes of undergraduate students of two different health programs i.e., pharmacy and medicine from the same university i.e., Monash University. Moreover, the professional stigmatizing attitudes of both health programs' students reduced as they became more professionalized.

In this study we chose the undergraduate students of the same program i.e., pharmacy from two universities i.e., Monash University and USM. The aim was to explore the bifurcation of stigmatizing attitudes, if it existed; and to compare the students' stigmatizing attitudes, conditioned on university. (See Table 14)

5.3.6 Statistical Analysis

In keeping with the previous chapter's data analysis, the modeling was carried out using the *geepack* package (224,262,263). *R* is a free programming software for computation and graphics; and its packages are also freely available from www.r-project.org (224,262,263).

The dependent variable was HIV/AIDS-related stigmatizing attitudes i.e., "stigma". We modeled the stigma and covariates i.e., knowledge, university (Monash

vs. USM), gender, year [of study] and type of stigma (personal vs. professional) and their functional form i.e., interaction between "type and year", and "type and university". We used, similar to the methodology described in the previous chapter, GEE method and "exchangeable" working correlation matrix. Equation 1 shows the formula of stigma model.

Equation 1 Stigma Model

$$Stigma \sim knowledge + university + gender + year + type + type \times year + type \times university$$

5.4 Results

Table 13 presents the results of bivariate analyses of the stigma, knowledge, university, gender, year [of the study] and types of stigma. Stigma was affected positively – decreased – by knowledge, gender and year. For instance, knowledge significantly reduced the stigma (0.06, p<.001) although the effect was small. Surprisingly, the effect of year on stigma was small and non-significant (-0.03, p 0.62). The types of stigma negatively affected – increased – the stigma for reasons we discuss later. Moreover, the professional stigma was significantly higher than the personal stigma (0.31, p<.001). It was speculated –form the results of bivariate analyses of type and year – that the idea of bifurcation of stigmatizing attitudes did not hold in this dataset. The bifurcation of stigmatizing attitudes is further discussed, by referring to the results of multivariate analysis, in the coming paragraphs. The effect of university on stigma was small and non-significant (0.15, p 0.14). Similarly, the effect of gender on stigma was small and non-significant (-0.12, p 0.11).

Table 13 Bivariate GEE analyses of *Stigma*

Variable	Stigma			
	β[1]	SE[2]	p	95% CI[3]
Covariates:				
Knowledge	**-0.06*****	0.014	<.001	-0.09 – -0.03
University (base=Monash)	0.15	0.10	0.14	-0.04 – 0.34
Gender (base=Male)	-0.12	0.074	0.11	-0.26 – 0.02
Predictors:				
Year	-0.03	0.038	0.62	-0.10 – 0.04
Type (base=Professional)	**0.31*****	0.037	<.001	0.24 – 0.38

*1- Parameter estimate coefficient, 2- [Robust] Standard Error, 3- Confidence interval, *** p <.001*

5.4.1 Professionalization of HIV/AIDS-related stigmatizing attitudes

We further explored the bifurcation of stigmatizing attitudes by conducting stratified analyses. That is we added the interaction effects of covariates to the bivariate GEE analyses of stigma. Our aim was to evaluate the interaction effects of covariates on stigma. We created two stratified models i.e., Monash Model and USM Model. (See Table 14 and Figure 11)

In the Monash Model, a pharmacy student with full knowledge showed a stigma score of 0.86 standard deviation (SD) lower than a pharmacy student with no knowledge (-0.14, p <.001). Year decreased the stigma significantly (-0.21, p <.05). Overall each additional year [spent in the pharmacy course] decreased the average levels of stigma i.e., (0.21 x 4 = 0.84). For example year three pharmacy students showed a stigma score of 0.61 standard deviation (SD) less than year two pharmacy students. Monash Female pharmacy students showed less stigmatizing attitudes compared with their male colleagues. The gender's effect on stigma, however, was small and non-significant (-0.08, p = 0.69).

The Monash Model supported the hypothesis, that the reduction in HIV/AIDS-related stigmatizing attitudes in the professional domain was more than the personal domain. However, the effect of type on stigma was very small and non-significant (-0.04, p = 0.89). In contrast to the hypothesis, the interaction effect of type and year increased the stigma. The effect size was small and non-significant (0.06, p = 0.53). Therefore, the Monash Model did not reflect hypothesized bifurcation of stigmatizing attitudes.

The USM Model, similar to the Monash Model, did not show the hypothesized bifurcation of stigmatizing attitudes. The interaction effect of type and year increased the stigma. The effect size, however, was small and non-significant (0.03, p = 0.48). Stigma was negatively –increased – associated with year, although the association was small and non-significant (0.03, p 0.43). (See Table 14)

The USM Model reflected less stigmatizing attitudes in female students compared with male students. The association between gender and stigma was significant (-0.17, p <.05). A USM student with full knowledge had a stigma score of 0.94 standard deviation (SD) less than a student with no knowledge. The effect of knowledge on stigma was small, but significant (-0.03, p <.1)

In contrast to the hypothesis, the USM Model showed that the reduction in HIV/AIDS-related stigmatizing attitudes in the personal domain was more than the professional domain. The effect of type on stigma was statistically significant (0.25, p <.1).

We tested the goodness-of-fit of the Monash Model and the USM Model using Quasi-likelihood under the independence model criterion (QIC) (265). This

approach is more robust and forms statistical scores that are asymptotically distributed (266). As shown in Table 14, the USM Model was a better fit than the Monash Model; because the USM Model had a Smaller QIC.

Figure 12presents the residual patterns of the Monash Model and USM Model. The visual inspection of ‘residual plots’ of the two GEE models i.e., Monash Model; and USM Model could indicate that although the models were not a strong fit, they could relatively supplement the interpretation of the QIC (274). That is the models were relatively a good fit for the data.

Table 14: Stratified (University) Multivariate GEE analyses of *stigma*

Variable	Monash				USM			
	β[1]	SE[2]	p	95% CI[3]	β	SE	p	95% CI
Covariates:								
Knowledge	**-0.14*****	0.042	<.001	-0.22 – -0.06	**-0.03**·	0.018	<.1	-0.06 – 0.00
Gender (base=Male)	-0.08	0.211	0.69	-0.49 – 0.33	**-0.17***	0.074	<.05	-0.31 – 0.03
Predictors:								
Year (base=First year)	**-0.21***	0.094	<.05	-0.39 – -0.03	0.03	0.046	0.43	-0.06 – 0.12
Type (base=Personal)	-0.04	0.318	0.89	-0.66 – 0.58	**0.25**·	0.136	<.1	-0.01 – 0.51
Interactions:								
Year: type	0.06	0.096	0.53	-0.12 – 0.24	0.03	0.046	0.48	-0.06 – 0.12
QIC[4]			-94				-298	

1-Parameter estimate coefficient, 2- [Robust] Standard Error,3- Confidence interval, 4- Quasi-likelihood under the independence model criterion

**** p <.001; ** p <.01; * p <.05; · p <.1 (significant p values)*

Figure 11: Multivariate GEE analyses of separately modeled probabilities of *stigma* conditioned on *female* students with *mean healthcare professionals knowledge* score

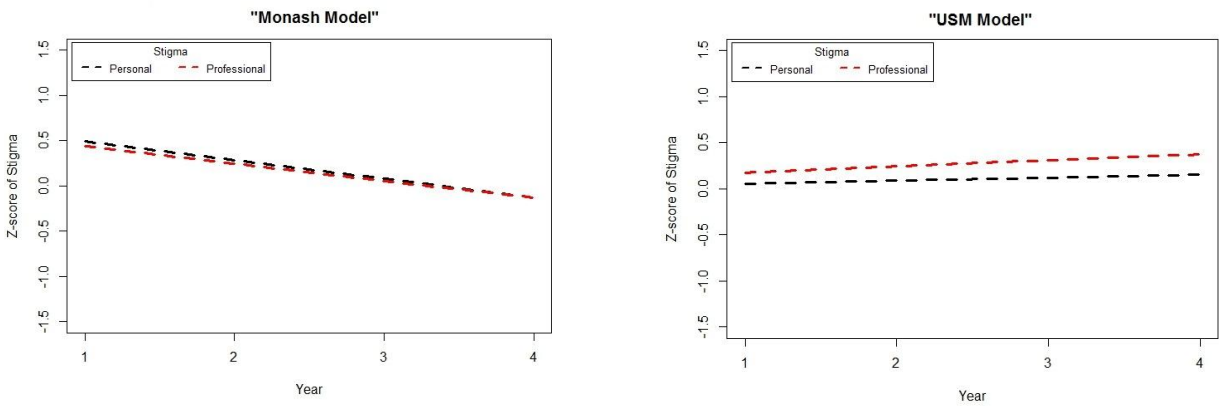
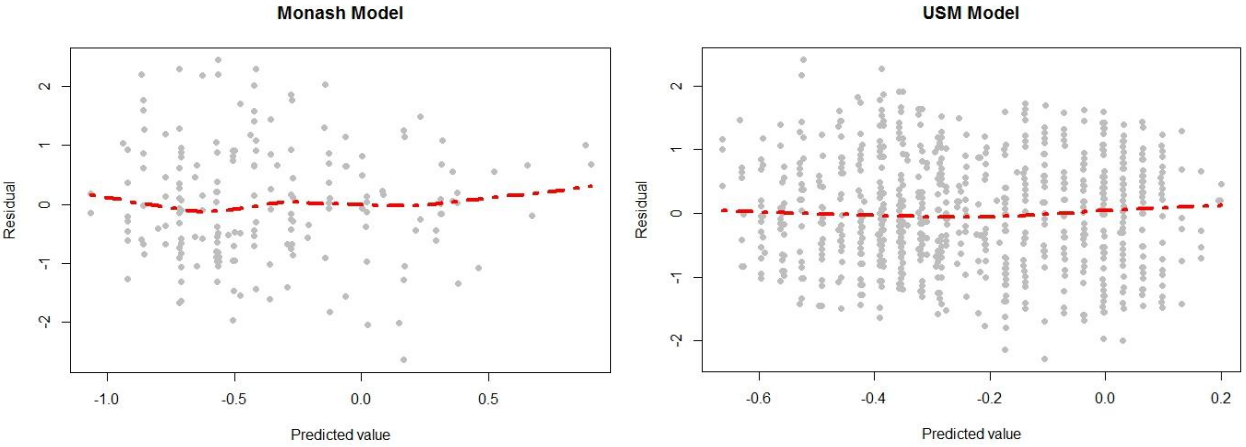


Figure 12: Residuals plot of the GEE Models



5.5 Discussion

The two main findings were: 1) there were differences in HIV/AIDS-related stigmatizing attitudes between universities; 2) overall, the older cohorts did not show lower levels of HIV/AIDS-related stigmatizing attitudes. Although, Monash University pharmacy students showed a decline in the personal and professional HIV/AIDS-related stigmatizing attitudes, USM pharmacy students did not show significant decline in their stigmatizing attitudes.

These findings are discussed within three themes. First, we discuss the differences in professionalization of stigmatizing attitudes among Monash University and USM students; and explore the differences in their curricula and teaching and learning activities as a possible explanation.

Second, we discuss the absence of bifurcation of stigmatizing attitudes by considering the measurement tool in greater details; and how we had operationalized professionalism. Finally, the discussion ends with an outline of methodological concerns and suggestion for future studies.

5.5.1 Differences in professionalization of stigmatizing attitudes Monash University students vs. USM students

Professionalization is a longitudinal process of acculturation and situational awareness that needs a continuous educational environment i.e., training in a healthcare course and in later professional life (41,42). In the educational environment the healthcare students are educated and reminded about the traits of the profession; and the importance of internalizing professionalism (42). Some pharmacy courses are more clinically focused and have a greater industrial orientation. Different curricula may give rise to differences in the professional roles and duties,

expected from the pharmacy students may give rise to variations in attitudes. The Monash pharmacy curriculum emphasizes the importance of social and behavioral contexts of illness while practicing as community or hospital pharmacists (295). In contrast, the USM pharmacy curriculum, emphasizes the importance of pharmaceutical marketing and management; and to a lesser extent underlines the clinical and social concepts such as pharmaceutical care (296).

The Monash pharmacy curriculum is more clinically focused with a greater emphasis on the societal and clinical duties of the graduates. The USM curriculum has a greater emphasis on pharmaceutical sciences. Although, the USM curriculum has been revised recently to become more clinical (Hassali M A, personal communication, July 24, 2014); the program outcomes of these two pharmacy curricula are not similar (295,296). Therefore, there are possibilities that the products of these two programs i.e., the pharmacy students might not be similar. For instance, Monash pharmacy curriculum puts a high premium on community service activities; and it has been shown that community service activities have a positive effect on students' personal and professional views (300,301).

The other reason for the observed differences between the Monash and USM results is more speculative and relates to the idea of the "hidden curriculum". The hidden curriculum was first used by Philip Jackson; and refers to implicit pattern(s) of social learning that prepares the learners to operate in their current or future working places (302,303). This learning is environment specific and is dependent on the interactions with faculty members, senior colleagues and peers. The hidden curriculum is an unintended socialization process that transcends formal education(304,305), and can have discordant effects on healthcare students'

developing professionalism (305,306). For example, academics, practitioners, senior colleagues, peers, and role models may, through observed actions or off-the-cuff remarks, either support or condemn the explicit messages about professional development in the formal curriculum. The latter could have detrimental effects on the values learnt by the healthcare students. The professionalization of healthcare students is not only driven by the course contents of the health curriculum; but is also influenced by the covert or hidden curriculum (306–309). The effects of hidden curriculum on learning is environment specific and is dependent on the interactions with faculty members, senior colleagues and peers.

Although hard to prove, one could venture the implicit effects of the hidden curriculum on the professionalization of HIV/AIDS-related stigmatizing attitudes of Monash pharmacy students compared with the USM pharmacy students. One may speculatively argue that the effects of hidden curriculum might have been less favorable towards the development of non-stigmatizing attitudes of USM students towards PLWHA.

The survey tool and how professionalism was operationalized may also shed some light on the differences between Monash University students and USM students. An examination of the items shows the questionnaire used in this study capitalized on the collegiality and decision making in hypothetical clinical scenarios. Pharmacy students, because of their shorter experiential clinical placements compared with medical students, might not have been able to relate to the scenarios as readily as was expected. Pharmacy students of Monash and USM have on average a clinical placement period of not more than three months compared with medical students' clinical placement that is two and a half year. Therefore, the current survey

tool might not be sensitive enough to capture divergence of HIV/AIDS-related stigmatizing attitudes among the pharmacy students. The concept of experiential learning and its relationship to professionalism is discussed in more details under the "bifurcation of HIV/AIDS-related stigmatizing attitudes."

Professionalism as a concept enjoys varieties of definitions and different modus operandi for its measurement (201,284,285,310). Medical educators and pharmacy educators have referred to certain traits in defining and measuring professionalism (45,284). For example, Chisholm *et al* developed a measure for professionalism among pharmacy students consisting of 6 tenets i.e., excellence, respectfulness, altruism, dutifulness, accountability, and truthfulness (284). The instrument items were a series of statements that primarily focused on the individuality of the pharmacists as professionals, without regards to the interactive dynamics among the pharmacists and other healthcare professionals. For instance, one of the items was: "*I follow through my responsibilities"* (284). In contrast, our measurement tool, primarily focused on the issues of collegiality, respect, and the ability to make decision. To measure the professional attitudes towards PLWHA, we extracted these traits from the documents on medical and pharmacy code of conducts. There is ,also, anecdotal evidence that professionalism increases as pharmacy students attend and complete their pharmacy course(311). Apparently, the measurement tool has captured the bifurcation of HIV/AIDS-related stigmatizing attitudes among the medical students and not the pharmacy students. (Refer to the pervious chapter)

The instrument items aimed at measuring the pharmacy students' attitudes while they were in a simulated healthcare environment. For example, one of the

items was: "*A colleague working as a nurse in the same hospital as you, tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive nurse should have her/his position terminated."* Professionalism has been operationalized, differently, i.e., to show no stigmatizing attitudes towards a colleague who is suffering from a stigmatizing disease. Here, the professionalism meant to be respectful and to show collegiality to a HIV positive health colleague.

5.5.2 Bifurcation of HIV/AIDS-related stigmatizing attitudes

We had hypothesized that the personal and the professional attitudes of healthcare students may diverge with increasing experience/professionalism. We suggest that this could be explained by considering the profession from a social point of view and observing the process of professionalization from a psychological point of view in the context of learning. Education in the context of moral actions is a process of "norm acquisition" (142,143).

As one learns more about the norms of the health profession – code of ethics and professional conducts – and tries to integrate the moral values of the new norms, a disharmony may be created between the newly learned norms and pre-existing personal values. For instance, a personal norm associated with condemning homosexuality and promiscuity, might conflict with the newly learned professional norm that requires the provision of equal care to *all* clients regardless of their social background and personal attributes. The attitudes towards the person may diverge over the personal and the professional domain (201). For instance, a pharmacy student may hold negative attitudes towards PLWHA, but s/he has learnt to be blind to the personal characteristics of the patients and to provide a standard package of professional care to all patients in a clinical setting.

In contrast to the idea of bifurcation of HIV/AIDS-related stigmatizing attitudes proposed by Ahmadi et al (201); and unlike the findings of the previous study (Study I) the results did not show the divergence of HIV/AIDS stigmatizing attitudes amongst pharmacy students. In either Monash Model or USM Model, one explanation could be the duration of clinical attachment in the pharmacy curricula of Monash University and USM. The pharmacy students in both universities take their experiential learning modules in the final year of their course for a period of not more than three months (295,296). Professionalism is found to be a determining factor in the assessment of experiential learning of pharmacy students (312). Students should depict professionalism in their attitudes and behaviors in order to meet the minimum requirements of any experiential learning module (312). It seems the ultra-short period of experiential learning (3 months out of 4 years) does not provide enough contact between pharmacy students and patients in real healthcare settings. This lack of exposure does not allow a reasonable shift in professionalization of pharmacy students' stigmatizing attitudes.

Schools of pharmacy and pharmaceutical sciences, pharmaceutical associations, etc. have continuously worked to adapt, monitor and maintain high standards of professionalism in pharmacy education and pharmacy practice (198,287,313,314). This is to allow a tangible and reasonable shift in professionalization of pharmacy students. More often than not, pharmacists have been recognized as underutilized members of healthcare team (315,316). Since, there has always been a demand for more active participation of pharmacists as part of healthcare team. Therefore, as challenging as it seems to be, it is crucial to encourage a shared vision and common strategy, for a global transformation in pharmacy

education (317,318). Referring to the findings of this research it seems that there is a need to homogenize pharmacy education across the countries (319).

Prior to becoming functional member of healthcare team, pharmacists and educators need to reach a consensus on defining, teaching and monitoring concepts such as professionalism and professional development. The consensus should be reached not only by the pharmacists but also by involving other members of healthcare team such as nurses, doctors, etc.

5.6 Limitations

One limitation of this study is the mapping of attitudes to behavior, where a respondent's self-reported attitude may not be congruent with their current or future behavior. An important step in the future research would be a behavioral analysis of practicing pharmacists in hospital settings. Although, we were aware of this limitation; however, we opted for the study of attitudes as part of an initial exploration to provide a base for a behavioral analysis research in the hospital settings; and the fact that attitudes might, somehow, reflect the current and/or future behavior. A second limitation, again common in this kind of research, relates to the limited respondent pool from which participants were drawn. The generalizability of these findings needs to be established in practicing pharmacists and pharmacist students of other institutions. A third limitation could have been the operationalization of professionalism in this study. Either in medicine or pharmacy, the healthcare students shall become more professional from the starting point in their health program to the end point (305,314). The professionalism continues as they join the professional workforce and offer their professional services to the members of the society (305,314). Therefore, the operationalization of

professionalism in terms of years spent in the pharmacy program might have been an oversimplifying approach that could have failed to capture the divergence of HIV/AIDS-related stigmatizing attitudes amongst the participants in this study.

RESULTS (Study III)

“While the primary purpose of medical research is to generate new knowledge, this goal can never take precedence over the rights and interests of individual research subjects.”

World Medical Association (Declaration of Helsinki)

6.1 Preamble

In the previous chapter we discussed the professionalization of stigmatizing attitudes among undergraduate pharmacy students of Monash University and Universiti Sains Malaysia (USM). We explored the differences in the professional development by investigating the differences in the curricula and teaching and learning activities. We also discussed the stigmatizing attitudes of students by: a) delving into the concepts of formal and informal – hidden – curriculum; and b) mulling over the items of the survey tool that aimed at measuring professionalism.

In this chapter we present the results of our panel design study. The main objective was to further explore the differences in HIV/AIDS-related stigmatizing attitudes of students within the cohorts and in between the cohorts. We measured the changes in the type (personal vs. professional) of HIV/AIDS-related stigmatizing attitudes of the students over a 6-month period.

These data were obtained from the undergraduate medical and pharmacy students at Monash University in a two point-in-time fashion. There was an average a 6-month time gap between the data collections.

6.2 Professionalism and HIV/AIDS related stigma: Measuring the attitude change over a 6-month period of professional development

6.2.1 Introduction

Professional development, in the health literature, is viewed as a learning process that enables healthcare students to construct independent personal and professional identities (34,52,53). The professional identity is the outcome of formal and informal learning during and after completing a professional course (54–56). Professional codes of conduct, internationally, are clear about the behavior expected of qualified healthcare professionals. Consistent among the expectation is that patient care should be based on need and not social position (57,58). Notwithstanding the expectations, the literature is replete with examples of health professionals who have failed to demonstrate their professional identity while providing care to their patients (59). One of the reasons for the failure to uphold the professional identity is the stigmatizing attitudes of health professionals because of perceived moral failing of their patients (30,60).

HIV/AIDS is a stigmatizing disease (8,191). Some health professionals have provided suboptimal care to people living with HIV/AIDS. The stigmatizing attitudes/behavior of health professionals seems to be related to the disagreement between the personal identity and the professional identity of such health professionals (26,320). Theoretically, as healthcare students' progress through the health professional course, their stigmatizing attitudes would diverge over the personal and the professional domains (201). Professionalization of stigmatizing attitudes is particularly crucial within the context of health services provision, because of the potential link between the trajectory of professional development and the trajectory of stigmatizing attitudes (201,35).

Although HIV/AIDS-related stigma among health professionals has been studied extensively, little work has attended to the relationship between professional development and stigmatizing attitudes. Indeed, most research has relied on cross-sectional data from single pool of participants in order to assess levels of stigma at a single point in time, without attempting to understand the effects of professional development on how stigmatizing attitudes may change over time (26,321–323).

Ahmadi *et al* hypothesized that there is an inversely proportional relationship between professional development and HIV/AIDS-related stigmatizing attitudes. That is more time spent in a professional course, lesser becomes the HIV/AIDS-related stigmatizing attitudes (201). For example, the levels of HIV/AIDS-related stigmatizing attitudes of year four healthcare students should be lower than the levels of stigmatizing attitudes of year three students; and levels of stigmatizing attitudes of year three students should be lower than the levels of stigmatizing attitudes of year two. Or, the levels of HIV/AIDS-related stigmatizing attitudes of, for instance, year four students at the end of year four would be lower compared with the beginning of year four.

Recall, one of the hypotheses was that ‘the levels of disease related stigma among healthcare students will decrease significantly with increasing levels of professionalization. Professionalization was operationalized in terms of years spent in the health program (201). One could expect, therefore, to observe changes in stigmatizing attitudes – a decrease – over the course of a full year.

This study extended earlier research (Study I) by examining the relationship between the stage of professional development and the changes in the stigmatizing attitudes (personal vs. professional) held about people living with HIV/AIDS. The

main objective of this study was to investigate the rate of change in stigmatizing attitudes conditioned on the type of stigma and the cohort of students.

6.3 Methods

We collected the data in two points in time and each time on two domains (personal stigma vs. professional stigma) for each student. That is for every student we calculated two personal stigma scores and two professional stigma scores. The stigma scores were calculated on the same metric both times. The panel design was specifically meant to assist in achieving the main objective of this study. We compared the mean of differences in differences of the stigmatizing attitudes to better understand the effects of professional development on the stigmatizing attitudes.

The Difference-in-Differences (DiD) estimates have been primarily applied in econometrics research (324–327). DiD approach is also used in other subject areas such as population health, medicine, etc. (328–331). We employed DiD technique to model the changes in stigmatizing attitudes by estimating the average difference between the types of stigma scores at two time points; and then to comparing the mean difference between the cohorts.

6.3.1 Participants

One hundred and sixty three (N=163) undergraduate pharmacy and medical students of Monash University participated in this study. The data were collected in a two point-in-time fashion. The first round of data was collected during the first 2 months of the first semester of the Monash academic year i.e., March and April. The second round of data was collected during the *'study vacation'* of the second

semester i.e., October. The study vacation is the period in which students prepare for their exams – prior to the end of semester exams – when there are no teaching activities. There was, on average a 6-month time gap between the two data collections points.

One hundred and fourteen (114) students were undergraduate medical students of MBBS program (mean age = 21.5, SD = 2.3) and 49 were undergraduate students of B.Pharm program (mean age = 20.9, SD = 1.7). Participants were from all 4 years of the B.Pharm program; and all 5 years of MBBS program. More than half (57.7%) of the participants were female students (n=94). All of the participants were from the Monash Malaysian and Australian campuses. More than 90% of the participants were from Monash Malaysian campus (n=150); and only less than 10% were from Monash Australian campuses. Slightly more than 15% of the total participants were in their first year and second year collectively. Thirty five percent were from third year; and slightly less than 45% were from fourth year. Fifth year medical students made up to 5% of the survey population. (See Table 8)

In the present study, we only included those participants who had agreed to provide their unique student ID during the first round and the second round of data collection. The student ID was allowed us to link each student's responses for the data analysis.

Table 15 Description of the study population

		Program	
		Pharmacy	**Medicine**
Age		Mean age = **20.9** yrs, SD = **1.7**	Mean age= **21.5** yrs, SD= **2.3**
Gender			
	Male	**14** (8.6%)	**55** (33.7%)
	Female	**35** (21.5%)	**59** (36.2%)
Site			
	Malaysia	**49** (30.1%)	**101** (61.9%)
	Australia	**0** (0.0%)	**13** (8.0%)
Year			
	Year 1	**9** (5.5%)	**1** (0.6%)
	Year 2	**4** (2.5%)	**11** (6.7%)
	Year 3	**11** (6.7%)	**49** (29.5%)
	Year 4	**25** (15.3%)	**46** (28.2%)
	Year 5	**Not applicable**	**8** (5.0%)

Note.- Total number N = 163

6.3.2 Materials

A survey was distributed to undergraduate pharmacy and medical students of Monash University at two points in time. The survey tool was identical to the one described in the previous study. The questionnaire contained (i) demographic questions, (ii) the validated scale for measuring HIV/AIDS related stigmatizing attitudes from a [health] professional's viewpoint, (iii) the validated scale for measuring HIV/AIDS related stigmatizing attitudes from a personal viewpoint, and (iv) a validated scale for measuring knowledge of HIV transmission.

The dependent variable was the differences in HIV/AIDS-related stigmatizing attitude or simply "differences in stigma". Hereinafter, we shall refer to differences in stigma as 'stigma change'. Stigma was operationalized in terms of different prospects: 1) personal view; 2) professional view.

6.3.3 Outcome

The outcome measure was the "stigma change" (first round personal and professional and second round personal and professional) i.e., the changes in the stigmatizing attitudes over a 6-month period. Because each participant contributed on two personal measures and on two professional measures, it was in effect a repeated measure of HIV/AIDS-related stigmatizing attitudes within each participant. To ensure that the attitudes were measured on the same metric, the stigma measures were rescaled to z-scores; i.e., they each had a mean of zero and a standard deviation of 1 (270). We calculated a professional stigma score and a personal stigma score for each participant twice. Then, we subtracted the first round personal and the professional stigma scores from those of the second round to calculate the difference in professional stigma and the difference in personal stigma score. Therefore, the difference in the stigma score was automatically rescaled to z-scores. Four stigma scores were calculated for each participant i.e.,

i) First round personal stigma z-score (1^{st} PerScoZ);
ii) First round professional stigma z-score (1^{st} ProScoZ);
iii) Second round personal stigma z-score (2^{nd} PerScoZ);
iv) Second round professional stigma z-score (2^{nd} ProScoZ).

Then, the differences of stigma z-scores (personal and professional) were calculated for each participant i.e.,

a) Difference in personal stigma z-score (Diff PerScoZ);
b) Difference in professional stigma z-score (Diff ProScoZ).

Equation 2 Differences in stigma z-score (personal and professional) formulae

$$Diff\ PerScoZ = 1st\ PerScoZ - 2nd\ PerScoZ$$

$$Diff\ ProScoZ = 1st\ ProScoZ - 2nd\ ProScoZ$$

- A **positive stigma change** z-score indicates **decreased** stigmatizing attitudes.

For example; if

$$1st\ PerScoZ = 0.7$$
$$2nd\ PerScoZ = 0.2$$
$$Diff\ PerScoZ = 0.7 - 0.2$$
$$Diff\ PerScoZ = +\mathbf{0.5}$$

(**+0.5** indicates decreased personal stigmatizing attitudes)

- A **negative stigma change** z-score indicates **increased** stigmatizing attitudes.

For example; if

$$1st\ ProScoZ = 0.7$$
$$2nd\ ProScoZ = 0.9$$
$$Diff\ ProScoZ = 0.7 - 0.9$$
$$Diff\ ProScoZ = -\mathbf{0.2}$$

(**-0.2** indicates increased professional stigmatizing attitudes)

- **Zero** indicates **no changes** in stigmatizing attitudes over a 6-month period.

6.3.4 Predictors

One of the predictors was the professional development that was operationalized in terms of year of study in a professional healthcare program i.e., the time spent – a 6-month period – in the healthcare course between the beginning of the first semester of an academic year and the end of the second semester of the same academic year.

The other predictor was the context in which the HIV/AIDS-related stigma occurred. The type of stigma was operationalized as personal and professional stigma. That is, the professional attitudes of healthcare students towards people living with HIV/AIDS (PLWHA) in the context of working environment in a healthcare setting; and their personal attitudes towards PLWHA in a personal situation.

6.3.5 Covariates

The covariates in the analyses were the participant's gender, site (Australia vs. Malaysia) and their level of HIV knowledge. Other covariates were the program (pharmacy vs. medicine), and their functional form i.e., interaction between "type and year" and "type and program".

6.3.6 Statistical Analysis

Similar to the previous chapter's data analysis, the modeling was carried out using the *geepack* package of R program(224,262,263). *R* is a free programming software for computation and graphics; and its packages are also freely available from www.r-project.org (224,262,263). We also compared the changes in stigma at the two time points, using *t*–tests (332).

We modeled the covariates i.e., knowledge, program (pharmacy vs. medicine), site (Malaysia vs. Australia), gender, year [the 6-month period] and type of stigma (personal vs. professional) and their functional form i.e., interaction between "type and year", and "type and program", using GEE method. We selected the "autoregressive" working correlation matrix, because the data were correlated within each cohort over the time (254).

Analyses comprised four steps. First, we explored the bifurcation of HIV/AIDS-related stigmatizing attitudes at the beginning (T1) and at the end of the 6-month period (T2). Second, we applied the paired *t*-tests i.e., paired *t*-test and Welch two sample *t*-tests to compare the stigma change over a year period. We also ran the *t*-tests stratified by type and program to explore the differences in difference of stigma (stigma change) conditioned on the type i.e., personal stigma vs. professional stigma. Third, we performed the bivariate association analyses to determine the relative size of association between the dependent variable i.e., stigma change and the covariates. Finally, we used the GEE method to explore the associations between the stigma change and the variables. The regression model contained covariates i.e., knowledge, site, program, gender, type; the predictors i.e., the year and the type; and the interaction between the covariates i.e., type and year; type and program. We employed the GEE method to model the association of stigma at the beginning and at the end with the covariates, predictors, and interaction between the covariates.

6.4 Results

6.4.1 Multivariate GEE analyses of the stigma at the beginning and at the end of the 6-month period

Table 16 shows the estimation of stigma accounted for by knowledge, program, site, gender, year, type, interactions between year and type, and program and type at two points in time i.e., at the beginning (T1) and at the end (T2) of a 6-month period. Stigma was positively affected – decreased – by knowledge and year at T1 and T2. A student with full knowledge showed a stigma score of 0.87 standard deviation (SD) less than a student with no knowledge.

A second year student would have a stigma score of 0.75 SD less than a first year student at the beginning of the 6-month period (-0.13, $p<.05$). A second year student had a stigma score of 0.65 SD less than a first year student at the end of the 6-month period (-0.20, $p<.01$). Malaysian students showed more stigmatizing attitudes compared with the Australian students at both T1 and T2. The association between site (Malaysia vs. Australia) and stigma was statistically significant at both times i.e., at T1 (0.70, $p<.001$) and at T2 (0.74, $p<.001$).

Stigma and type (personal vs. professional) had a statistically significant association (2.27, $p<.001$). Students showed more professional stigmatizing attitudes compared with the personal stigmatizing attitudes at T1. Similar to the stigma and type association at T1, student showed more professional stigmatizing attitudes compared with the personal stigmatizing attitudes at the end of the 6-month period (2.31, $p<.001$).

At the end of the 6-month period, medical students showed a stigma score of 0.95 SD more than the pharmacy students. The effect of program on stigma, at T2,

was significant (0.38, p<.05). At T1, however, the effect of program (pharmacy vs. medicine) on stigma was small and non-significant (0.08, p = 0.50). At T1 and T2 female students showed more stigmatizing attitudes than male students. The association of stigma and gender was statistically non-significant.

In Stigma (T1) Model, the interaction between program and year, increased the stigma. That is a pharmacy student would have a personal stigma score of 0.88 SD more than a medical student (0.18, p = 0.15). In Stigma (T2) Model, the interaction between program and year affected stigma positively. That is a pharmacy student would have a personal stigma score of 0.48 SD less than a medical student (-0.23, p = 012). The association of stigma and program and type interaction was, however, statistically non-significant at the beginning and at the end of the 6-month period.

Table 16: Multivariate GEE analyses of *stigma* at the *beginning* and at the *end* of the 6-month period

Variable	Stigma (T1)[1]				Stigma (T2)[2]			
	B[3]	**SE**[4]	**p**	**95% CI**[5]	**β**	**SE**	**p**	**95% CI**
Covariates:								
Knowledge	**-0.09*****	0.02	<.001	-0.13 – -0.04	**-0.07***	0.03	<.05	-0.13 – -0.01
Program (base=pharmacy)	0.08	0.11	0.50	-0.14 – 0.30	**0.38***	0.16	<.05	0.05 – 0.70
Site (base=Malaysia)	**0.70*****	0.14	<.001	0.41 – 0.99	**0.74*****	0.21	<.001	0.32 – 1.16
Gender (base=Male)	0.12	0.11	0.25	-0.09 – 0.33	0.01	0.13	0.93	-0.24 – 0.27
Predictors:								
Year	**-0.13***	0.06	<.05	-0.25 – -0.02	**-0.20****	0.07	<.01	-0.35 – -0.05
Type (base=Personal)	**2.27*****	0.29	<.001	1.70 – 2.84	**2.31*****	0.28	<.001	1.75 – 2.86
Interactions:								
Year: type	**-0.13**·	0.08	<.1	-0.28 – 0.02	0.01	0.08	0.87	-0.14 – 0.17
Program: type	0.18	0.15	0.23	-0.12 – 0.48	-0.23	0.15	0.12	-0.52 – 0.06

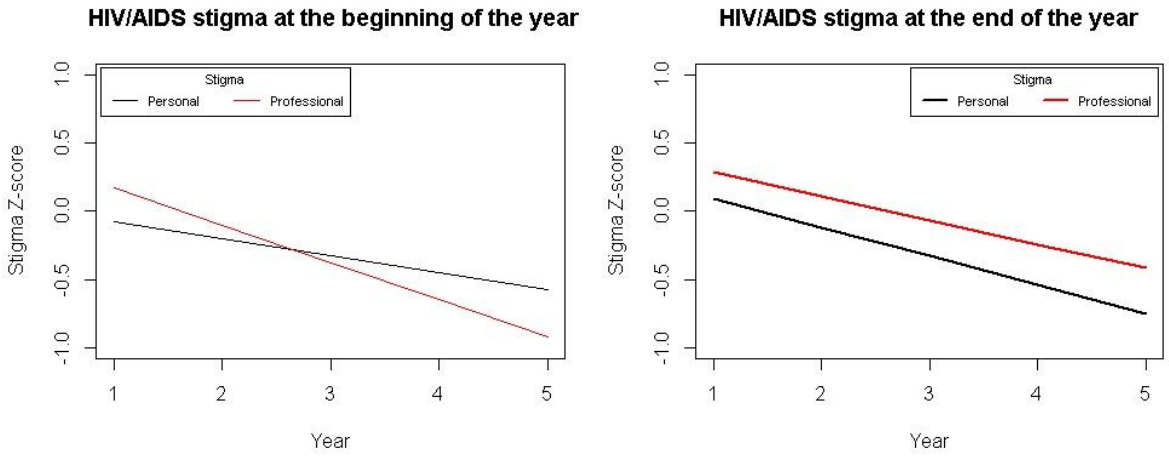
1- T1 = At the beginning of the 6-month period, 2- T2 = At the end of the 6-month period,

*3- Parameter estimate coefficient, 4- [Robust] Standard Error, 5- Confidence interval, *** p <.001; ** p <.01; * p <.05; · p <.1 (significant p values)*

6.4.2 Bifurcation of stigmatizing attitudes at the beginning and at the end of the 6-month period

Stigma (T1) Model revealed the bifurcation of HIV/AIDS stigmatizing attitudes. Ahmadi *et al* proposed the idea of bifurcation of social attitudes in 2013 (201). The association between stigma and year and type interaction was statistically significant (-0.13, p<.1). Stigma (T2) Model, however, did not show the bifurcation of HIV/AIDS stigmatizing attitudes. The effects of year and type on interaction on stigma was very small and non-significant (0.01, p = 0.87). (See Figure 13)

Figure 13: GEE models of HIV/AIDS stigmatizing attitudes at the beginning and at the end of the academic year



6.4.3 Bivariate analysis of the stigma change

Table 17 presents the results of bivariate analyses of the stigma change, knowledge, program, site, gender, year and types of stigma. Stigma change was affected negatively by knowledge, program, site, type and year (the predictors). That is the stigmatizing attitudes had increased over a 6-month period. For instance, stigmatizing attitudes had increased by knowledge, [pharmacy] program, being student of [Sunway campus] site, and the year. Except for the type, the effects were small and statistically non-significant. The professional stigmatizing attitudes were significantly higher than the personal stigmatizing attitudes. Moreover, the changes in professional stigma indicated a significant increase in stigmatizing attitudes over a 6-month period (-0.38, p<.001).

Table 17 Bivariate analysis of the relationship between the *stigma change* and covariates

Variable	Stigma change			
	β[1]	**SE**[2]	**p**	**95% CI**[3]
Covariates:				
Knowledge	-0.01	0.022	0.55	-0.05 – 0.03
Program (base=pharmacy)	-0.10	0.122	0.35	-0.34 – 0.14
Site (base=Malaysia)	-0.02	0.131	0.89	-0.27 – 0.24
Gender (base=Male)	0.13	0.109	0.21	-0.08 – 0.34
Predictors:				
Year	-0.01	0.063	0.88	-0.13 – 0.11
Type (base=Professional)	**-0.38*****	0.080	<.001	-0.54 – -0.22

*1- Parameter estimate coefficient, 2- [Robust] Standard Error, 3- Confidence interval, *** p <.001,*
4- Beginning of the academic year

6.4.4 Modeling the differences in stigma

Stigma change Model was developed by adding interaction effects to the bivariate analyses of stigma change. The stigma change Model showed the estimation of changes in stigma accounted for by knowledge, program, site, gender, year, type, interactions between year and type, and program and type. (See Table 18)

Table 18 Multivariate GEE analyses of the *stigma change*

Variable	Stigma change			
	β[1]	SE[2]	p	95% CI[3]
Covariates:				
Knowledge	-0.02	0.023	0.455	-0.06 – 0.03
Program (base=pharmacy)	**-0.29***	0.147	<.05	-0.57 – 0.00
Site (base=Malaysia)	-0.03	0.135	0.78	-0.29 – 0.23
Gender (base=Male)	0.11	0.109	0.30	-0.10 – 0.32
Predictors:				
Year	0.06	0.067	0.36	-0.07 – 0.19
Type (base=Professional)	-0.02	0.320	0.94	-0.64 – 0.60
Interactions:				
Year: type	-0.14	0.089	0.10	-0.31 – 0.03
Program: type	**0.41***	0.184	<.05	0.04 – 0.77

*1- Parameter estimate coefficient, 2- [Robust] Standard Error, 3- Confidence interval, *p <.05*

Except for the year and the program and type interaction, stigma change was negatively affected by the covariates and their interaction. That is HIV/AIDS-related stigmatizing attitudes increased insignificantly by knowledge, site, type and year and type interaction. Program affected the stigma change significantly. That is medical students showed higher levels of stigmatizing attitudes compared with pharmacy students (-0.29, p<.05).

In contrast to the bivariate analyses, year was positively associated with the stigma changes i.e., levels of HIV/AIDS-related stigmatizing attitudes decreased for every year spent in the health programs; although the effect was small and non-significant (0.06, p=0.36). Unlike the bivariate analyses, the changes in the professional stigmatizing attitudes were unfavorable i.e., the professional stigmatizing attitudes were slightly higher – although non-significant – than the personal stigmatizing attitudes (-0.02, p=0.94).

The stigma change Model also showed a negative association between the stigma change and the interaction between type and year. The students' professional stigmatizing attitudes had increased over a year spent in the medical and pharmacy programs. The association, however, was non-significant (-0.14, p=0.10). The stigma change was positively and significantly associated with the interaction between program and type (0.41, p<.05) i.e., there was significantly more reduction in the personal stigmatizing attitudes of the medical students compared with the pharmacy students.

6.4.5 Differences in differences estimator of stigma change

To explore the stigma change variable further, we compared the differences in the stigma change conditioned on the type of stigma and the year. Although the association of stigma change and type and year interaction was non-significant, the p value of 0.10 warranted further investigation for more detailed analysis of associations between stigma change and type; and between stigma change and year.

Therefore, we compared the changes in the personal stigmatizing attitudes of first year students with those of the second year students. Or, we compared the changes in the professional stigmatizing attitudes with the changes in the personal

stigmatizing attitudes of first year students. We ran a series of paired *t*-tests and Welch two sample *t*-tests to compare the means of stigma change (333). The main aim was to explore the effects of professional development on the intra-cohort (within the cohorts) and inter-cohort (between the cohorts) variability of stigma change.

The paired *t*-test revealed that there was a significant difference between the personal stigma change and the professional stigma change. The mean of personal stigma change was greater than the mean of professional stigma change (mean of the difference = 0.39, t = 4.83, p<.001). The mean of personal stigma change was positive (Mean = 0.10, SD = 0.76). That is there was a decrease in the personal stigmatizing attitudes of the students. The mean of professional stigma change was negative (Mean = -0.29, SD = 0.94) i.e., there was an increase in the professional stigmatizing attitudes of the students. (See Figure 14)

Figure 14: Differences in differences estimate of the *type* of HIV/AIDS stigma

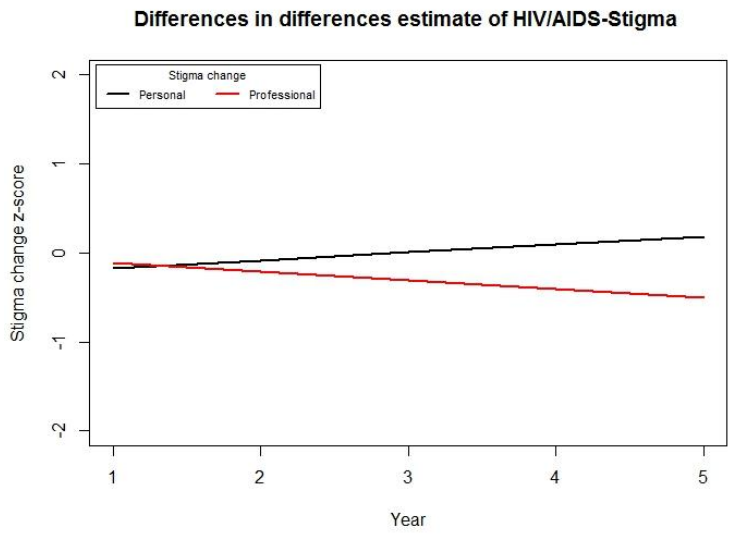
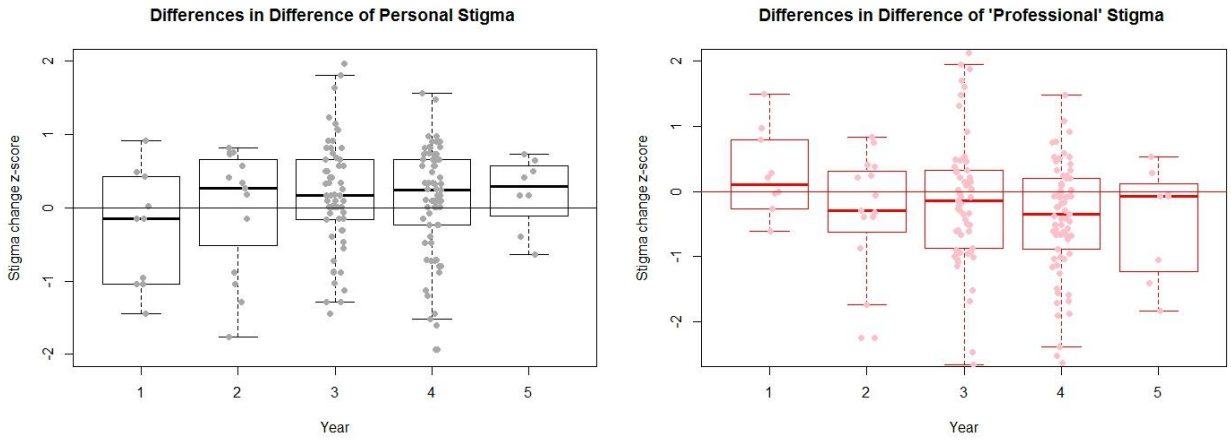


Figure 15 is the box plot presentation of the variability of stigma change conditioned on year. We used a series of Welch two sample *t*-tests to compare the mean difference of the personal stigma change between the cohorts. We compared the mean of personal stigma change between two cohorts each time. That is the comparison was made between the students of year one and year two, year two and year three, year three and year four, and year four and year five. The mean of personal stigma change was different for every compared cohort. However, the differences were small and statistically non-significant. We compared the mean of professional stigma change in an identical approach to the above-said. Similar to the personal stigma change, the differences in the mean of professional stigma change were small and statistically non-significant.

We also compared the mean difference of the personal stigma change with the professional stigma change within each cohort. For instance, we applied the paired *t*-tests to examine the means of personal stigma change and the means of professional stigma change of year one students. The differences in the means of personal and professional stigma change were small and non-significant, except, for year three and year four cohorts.

For the year three cohort, the mean of personal stigma change was higher than the mean of professional stigma change (mean of the difference = 0.33, $t = 2.66$, $p<.01$). For the year four cohort, the mean of personal stigma change was greater than the mean of professional stigma change (mean of the difference = 0.50, $t = 4.03$, $p<.001$).

Figure 15: Differences in differences estimate of HIV/AIDS stigma conditioned on the *year*



6.5 Discussion

Findings are discussed within three themes. First, we suggest reasons for why bifurcation of social attitudes was absent at the end of the 6-month period; and why bifurcation of stigmatizing attitudes existed at the beginning of the 6-month period. Second, we discuss the differences in differences of stigma conditioned on the type and the year. We attempt to identify the reason(s) why the hypothesized relationship between professionalization and changes in stigmatizing attitudes did not hold. Finally, the discussion ends with an outline of methodological concerns and suggestion for future studies.

Professionals are on a continuum of professional development; and their levels of professionalism may vary at different points in time in relation to the amount of acquired knowledge and skills, professional duties, occupational stress, working environment, etc. (334). The literature is replete with studies on the association between stressful working environment, burnout[27] and professionalism amongst health professions students and health professionals (336–342). Stress can negatively affect professionalism and can cause "deprofessionalization" of healthcare professionals (343,344). We collected the second round of the data, during the study vacation period. Students are to prepare for the end of semester exams during the study leave. One could argue that the students might have experienced anxiety, stress and burnout prior to their exams, which could have negatively affected their professional attitudes in relation to HIV/AIDS-related stigma.

[27] Burnout is a syndrome that is the result of continuing stress. Burnout manifests itself in physical and mental exhaustion (335).

We refer to the "tunnel vision" concept to further explore the reasons for the increasing stigmatizing attitudes of the participants at the end of the 6-month period. From the optometry point of view tunnel vision is the inability to effectively process the visual information located in the periphery (345). In the context of this study, tunnel vision could arguably exemplify the participants' focus on their final exams; and their inability to acknowledge their professional identity while reporting their professional stigma attitudes. Some view tunnel vision as an indicator of unprofessional demeanor and a sign of weakness (346). Therefore, we concluded that tunnel vision could be part of explanation that why professional stigma had increased over a 6-month period.

The time period in which we collected the data for the second time could explain the absence of bifurcation of stigmatizing attitudes. As described earlier the study vacation and exams-induced stress might have affected the professionalism in the students. Recall from the theoretical framework (See Methodology chapter), we suggested that the divergence in the one's attitudes is the aftermath of a mental juggling between a less challenging – a more intuitive – personal norms and a more challenging –a more analysis-driven reasoning – professional norms. Upholding the professional identity requires more of the students' analysis skills and as the analysis skills were focused on preparation for the final exams; the professionalism might have slipped at the point of second data collection. That's why the HIV/AIDS stigmatizing attitudes did not diverge between the personal domain and the professional domain.

As per hypothesis, the HIV/AIDS stigmatizing attitudes, however, branched off between the personal domain and the professional domain during the first round

of data collection. We collected the data during the first two months of the first semester. The period is relatively a stress-free period when there are no major exams. Moreover, the first semester in every academic year comes after a long break. We speculate that self-reported professional stigmatizing attitudes at the beginning of the 6-month period could be explained by delving into the professionalism. Professionalism is a phenomenon that undergoes constant reconstruction (347). That is the professional identity of a student can be restored, once the student finds ways to put an end to destructive stimuli e.g., stress, burnout, etc. Hence, there was bifurcation of HIV/AIDS stigmatizing attitudes at the beginning of the 6-month period.

6.6 Limitations

Unfortunately, the study was limited because it compared mean differences in attitudes of cohorts of students, but it did not look at changes of attitudes within individuals over time. The second limitation of this study is the small sample size. We have reported our findings from 163 respondents over a 6-months period. We are acutely aware that these findings cannot and should not be generalized to Monash undergraduate medical and pharmacy students. Ideally, one should try to collect the data from as many students as possible for a longer period of time. Moreover, the fact that the participants in Study III had voluntarily agreed to provide their unique student ID can be considered a limitation. Although, the student ID was only used to link student's response to their previous response, the students might have not reported their actual attitudes for the fear of being identified. The other limitation is the short follow up period. It is preferable to conduct a five year follow up study for the medical program and a four year follow up study for the pharmacy program to

capture the changes in stigmatizing attitudes as the students get professionalized and graduate.

DISCUSSION

“Freedom is hammered out on the anvil of discussion, dissent, and debate.”

Hubert H. Humphrey

7.1 Preamble

In the previous chapters we discussed the scale development of the two HIV/AIDS-related stigma measures. Recall, one of the measurement tools was developed and validated to measure HIV/AIDS-related stigmatizing attitudes from a personal point of view; and the other tool measured the same from a professional point of view.

We, also, presented the findings of each of the three studies in the result chapters i.e., *Study I*, *Study II* and *Study III*. Although the findings were reported under the "Methodology" and "Results" sections of the thesis; but, the presentation of the findings was similar to that of the articles. That is each section (chapter) consisted of introduction; methods; results; discussions and conclusions.

In this chapter we refer to the discussions presented in the previous chapters, to provide a reflection on the findings of this study. Moreover, we discuss the findings in a more robust and holistic manner – with reference to the hypotheses – to integrate the findings to form an interpretive summary to further explain the development of professionalism and reduction in stigmatizing attitudes.

7.2 Summary of the research hypotheses

It seems helpful to repost the summary of the hypotheses as the reference points while discussing the findings. The hypotheses are:

1. Healthcare students will demonstrate significant levels of disease related stigma. There is a significant difference in disease related stigma between the personal and professional domain.

2. The levels of disease related stigma among healthcare students will decrease significantly with increasing levels of professionalization.

3. On average, healthcare students will evaluate disease in healthcare situation in a less stigmatizing fashion than disease in social/private situation.

4. The rate of decreasing disease related stigma associated with increasing levels of professionalization will be greater for evaluations of disease in healthcare situations than for evaluations of disease in social/private situations.

7.3 Scale development

To test the hypotheses, first, we needed to have the measurement tools that could reliably measure the levels of HIV/AIDS-related stigmatizing attitudes of healthcare students from the *personal* point of view as well as the *professional* point of view. After the literature search it became evident that there were many publications on measuring the HIV/AIDS-related stigma in a *private* domain. Hence, it was decided to pool those items which seemed to be fit and suitable indicators in answering the objectives of this research.

In contrast, there appeared to be no/few papers describing measures suitable for measuring the HIV/AIDS-related stigma from a health professional point of view in a [virtual or actual] health working environment. It was apparent from a review of

the identified instruments that none were designed for measuring the *professional* HIV/AIDS-related stigmatizing attitudes.

As a consequence we chose to adapt existing measures of HIV/AIDS-related stigmatizing attitudes in a private domain; and develop a tool for measuring professional HIV/AIDS-related stigmatizing attitudes using a semi Delphi technique. The following describes the approach in creating the HIV/AIDS-related measurement tool to measure professional and personal stigmatizing attitudes of healthcare students. The two validated and reliable measurement tools – described here – set the foundation for testing the hypotheses in measuring the levels of professionalism and the levels of stigmatizing attitudes of the participants.

7.3.1 Methodological considerations in relation to scale development

Several scales for measuring HIV/AIDS related stigma have been developed previously (191,87,217,219,17,218). Measurement of stigma mainly serves to increase our understanding of stigma, the extent and severity of stigma in a setting or community and ,also, the changes in stigma – over a given period of time (88). A common characteristic of most of the HIV/AIDS-related stigma scales – and a broader term disease-related stigma scales – is their content-specificity (88). That is these scales assess the – different aspects of – stigma amongst a particular group of people from a specific point of view over a specific period of time. Moreover, multidimensional and multilayered nature of stigma specially the HIV/AIDS-related stigma has made the researchers to develop and validate content specific measurement tools that could best answer their research questions. For example, some researchers have identified the fear of infection, stigma by association, prejudice and stereotype as the main dimensions of HIV/AIDS stigma (180,183,348);

whereas, some researchers have measured social rejection, values linked with immoral behavior, financial insecurity, social isolation and internalized shame as the main dimensions of HIV/AIDS stigma (36,79,349).

Studies of HIV/AIDS stigma among healthcare professionals have mainly utilized the traits of professionalism in the context of provision of care to measure stigma. For instance, the traits of professionalism such as willingness to provide care to HIV/AIDS patients, knowledge of HIV transmission, empathy towards HIV positive patients without regards to their perceived immoral behaviors have constituted the dimensions of HIV/AIDS stigma tools (75,170,350). A traditional assumption in studies investigating HIV/AIDS-related stigma among [future] healthcare professionals is the notion that there is no distinction between the personal and the professional domains of stigma within the mind and the behavior of healthcare professionals (17,323). On contrary in this study, we proposed the notion of bifurcation of HIV/AIDS-related stigmatizing attitudes of healthcare students; and presented a theoretical and conceptual framework to outline the etiology behind the idea of divergence in the stigmatizing attitudes of healthcare students as they become more professionalized. (See 2.3 Theoretical and conceptual framework)

As we had challenged the traditional notion of indifference between the personal viewpoint and the professional viewpoint of healthcare professionals' HIV/AIDS-related stigmatizing attitudes; we needed a scale that could measure the personal domain and the professional domain of stigma among healthcare students. Thus, the two measurement tools i.e., the personal stigma scale and the professional stigma scale were developed and validated. (See pages 68 – 95)

We defined the personal domain and the professional domain as context variables i.e., the attitudes towards a HIV positive *person* in a personal/private setting vs. the attitudes towards a HIV positive *patient* in a healthcare setting. Therefore, the selection of the items to measure the personal domain and the professional domain of stigma principally relied on the willingness to interact with PLWHA personally or professionally and to recognize them as functional part of the society. For example, if I agree a HIV positive physician should be allowed to work or if I agree with the involvement of a HIV positive person as a police officer.

Our approach in devising the stigma scale involved qualitative content development technique (two-round modified Delphi technique); innovative quantitative technique (Mokken Scale Analysis); and a more common quantitative technique (Principal Component Analysis). The results of this mixed method technique demonstrated that it is possible to have a brief, standardized tool to measure HIV/AIDS-related stigma among healthcare students. This approach was successful because not only we could demonstrate the bifurcation of HIV/AIDS-related stigmatizing attitudes; but also, we could measure the levels of personal HIV/AIDS-related stigmatizing attitudes vs. the levels of professional HIV/AIDS-related stigmatizing attitudes over a course of professional development.

Our aim was to create and validate a measurement tool that is firmly anchored in capturing the personal domain and the professional domain of stigmatizing attitudes of healthcare students towards PLWHA to test the relationship between reduction in stigmatizing attitudes and professionalization. To define the personal attitudes vs. the professional attitudes, we treated the personal domain and the professional domain as context variables i.e., home setting vs. clinical setting. For

instance, items like “PLWHA to be allowed within one's social circle or not” vs. “A HIV positive colleague to be terminated or allowed to work” that influence something akin to social distancing.

However, generally accepted concepts of professionalism in medical education with respect to socially marginalized people emphasize attitudes and behavior toward patients where social distancing is not a straightforward option, such as communication and quality of care (351,352). Therefore, one might equally think of examining the bifurcation of stigmatizing attitudes via creating hypothetical scenarios that could create a more pronounced distinction between the personal and the professional attitudes. In this light might be something like willingness to touch a HIV positive person/patient in the clinic vs. home setting. This raises interesting issues regarding the interplay between personal and professional attitudes. That is, under what conditions of practice is the relation between these attitudes stronger or weaker (e.g., in cases where demand outpaces resources)? Or, If time is limited, can a physician with negative personal attitudes satisfactorily justify to him/herself not touching a HIV positive patient in his/her exam room, whereas with more time available in clinic, can the professional positive attitude win out?

We hope that future studies could further examine the notion of bifurcation of stigmatizing attitudes by using the personal and the professional stigma scales to report findings that are operationally and conceptually consistent in other study population (240). We need stigma measurement tools that could works well across diverse country contexts, healthcare settings and health worker types (353).

Development of the Personal and the Professional scales that was complemented with successful validity and reliability testing, paved the path for the

examination of the hypotheses. Now that we had the necessary tools to measure the HIV/AIDS-related stigmatizing attitudes of healthcare students in two domains i.e., professional and personal; we conducted three studies to investigate the impact of professionalization processes on stigmatizing attitude changes. The findings of the three studies i.e., *Study I, Study II* and *Study III* are further discussed in this chapter.

It seems necessary to also discuss the limitations of the two stigma scale that we developed and validated. These limitations may not reduce the value and importance of the two stigma scales; but, could provide a more robust view of properties of analyses described in the development of such scales.

Limitations

There are two broad limitations associated with the analysis described here. There are some limitations on the generalizability of the findings. The sample, was of reasonable size – certainly larger than some studies (233) – but drawn from a single university population – homogeneous at least with respect to their educational experience. By virtue of this, caution should be taken when generalizing the scale to healthcare professionals more broadly. However, it is worthy to note that, as the focus of this study was on the development of measurement tools and establishing its validity and reliability, and not on comparing the groups of people and generalizing the findings, the data presented here could be considered adequate.(187) Moreover, there is some evidence to suggest that Mokken scales developed in a student population such as this are likely to generalize reasonably well to graduated healthcare professionals (234). This, nonetheless, remains an empirical question and warrants investigation with future uses of the scale in a new population. The second limitation – an inherent problem with these kinds of scales – is the mapping of

attitudes to behavior, where a respondent's self-reported attitude may not be congruent with current or future behavior. An important step in the future validation of the scale would be a behavioral analysis of healthcare professionals.

7.4 Summary of the principal findings

As we have stated earlier, it would have been ideal to be able to follow up a cohort or cohorts of students through their undergraduate education to explore changes in their HIV/AIDS-related stigmatizing attitudes throughout their undergraduate training – professional development. However, as this was not feasible, we developed novel ways of exploring changes in stigma throughout undergraduate training, utilizing comparisons between Pharmacy program and Medical program (*Study I*); between different schools of Pharmacy (*Study II*); and between the beginning and end of academic years (*Study III*).

7.4.1 Bifurcation of social attitudes of healthcare students

The fundamental finding of *Study I*, was the *'bifurcation'* of HIV/AIDS-related stigmatizing attitudes amongst healthcare students. As healthcare students became more professionalized their HIV/AIDS-related stigmatizing attitudes branched off between two domains:

1- The professional domain in which the behavioral intentions towards PLWHA are work related in a health working environment.

2- The personal domain in which the behavioral intentions towards PLWHA are at personal levels and in private situations.

The findings of *Study I* conforms to the notion that the attitudes of healthcare students can diverge between the personal domain and the professional domain (201). The HIV/AIDS-related stigmatizing attitudes of Monash medical and pharmacy students, showed a significant decline for every year spent in medicine and pharmacy programs, respectively. The decline in the HIV/AIDS-related stigmatizing

attitudes substantiates the '*professionalization*' of HIV/AIDS stigmatizing attitudes i.e., reduction in stigmatizing attitudes.

The healthcare professionalism literature is rife with different instruments and indicators to measure professionalism and professional development (294,311,354–357). We used the year as the only reasonably available proxy for professional development; and within the context of this study, years of study was found to be instrumental in measuring the levels of professionalization. Therefore, we suggest the use of year spent in a health program as a proxy for measuring professionalism, so that the suitability and functionality of this proxy could be explored further.

As per our hypothesis, on average the HIV/AIDS stigmatizing attitudes in the professional domain declined faster than the HIV/AIDS stigmatizing attitudes in the personal domain. A steeper decline in the professional domain of stigmatizing attitudes, further supports the professionalization of HIV/AIDS stigmatizing attitudes. Our findings complement the current literature that HIV/AIDS-related stigmatizing attitudes are associated with knowledge, nature of professional training of different health professionals , social and cultural beliefs (35,201,239,246,275,276). For instance, knowledge decreased the HIV/AIDS-related stigmatizing attitude significantly. The effect of knowledge on stigma also complements the discussion on professionalization of HIV/AIDS-related stigma. Medical education literature may profit from a broader view on the professionalization of HIV/AID-related stigma among the participants in *Study I.* That is in contrast to the findings of some studies showing declines in empathy of healthcare students over the course of professional development (358,359), this study showed decrease in stigmatizing attitudes of healthcare students across cohorts. This

differential trend merits further investigations to better understand the professionalization and methods of measuring changes in the attitudes/behavior of healthcare students. It might be worthy to, first, disentangle the personal domain and the professional domain of an attitude such as empathy, stigma, etc. and, then, measure the changes in the attitude over a prescribed professional course. In the context of health and healthcare delivery, the significance and importance of changes in the professional domain of an attitude supersedes the changes in the personal domain.

In *Study I*, on average the medical students showed significantly less stigmatizing attitudes compared with the pharmacy students. We speculated the difference is because of more knowledge and more clinical exposure –especially year 3, 4 and 5- of medical students. Different health programs train the health professionals according to the job descriptions of that profession(183,239,247). The differences in stigmatizing attitudes of Monash medical students vs. Monash pharmacy students could provide a wide-angled view for medical educationists. Medical students' less stigmatizing attitudes might be course-related or person related. In general, medical courses are more clinically-oriented compared with pharmacy courses. On average, medical students have more exposure to clinical settings and [simulated] patients throughout their professional course compared with pharmacy students. Thus, the relationship between professionalization and reduction in stigmatizing attitudes was more prominent among medical students.

Moreover, one could equally consider the personality traits of medical and pharmacy students (355,360–362); and how the personality characteristic could predict the professionalization of attitudes and behaviors in explaining the

differences in the stigmatizing attitudes of Monash medical and pharmacy students. Individuals usually tend to choose careers that matches their personality (363). Historically, patients have been the focus of medical care (364);whereas, pharmacy has traditionally been a product-focused science (360). Therefore, one might cautiously claim that individuals with personality traits that are more inclined towards the provision of care to patients may become more professionalized compared with those individuals whose personality characteristics are less patient-oriented. Although, the course structure of pharmacy programs have been transformed to become more patient-centric and clinical (293); the clinical and patient care components of pharmacy courses are less than the medical courses.

In *Study I* Monash Australia students showed less stigmatizing attitudes compared with Monash Malaysia students. HIV/AIDS, a highly stigmatizing disease, is a classic example of a health condition that requires clinical as well as social care. It is proven that cultural beliefs, social concepts, societal perceptions and acceptance of family/community are among the determinants of HIV/AIDS-related stigmatizing attitudes (96,275,278,365,366). The findings of *Study I* hints at a critical insight that healthcare students' professional development should be expanded on by recognizing that professional education and professional socialization are also competing with broader social forces such as practical wisdom (phrenosis), cultural and societal norms (367,47,48,368).

Monash medical students, for instance, shall undergo similar professional training according to the course structure, shall have the same entry requirements whether they are enrolled in Malaysia or Australia. The social forces like culture, beliefs and societal norms, however, are different for the students who are in the

Australian campus compared with the students of the Malaysian campus. Therefore, the professionalization of the Monash medical students might not necessarily followed the same trajectory because professional development is influenced by education, curriculum, personal traits, society, beliefs and cultural norms.

Universities like Monash University that have campuses in different parts of the world can provide us with an opportunity to better understand how professional development is affected by curriculum, personality traits, cultural norms and interaction with peers. It is crucial to give importance to all of the variables that contribute to the professional development of healthcare students. It seems illogical to give weightage to the educational and clinical aspects of professional development and not to equally acknowledge the significance of social forces in the development of professionalism in healthcare students. In *Study I* we observed that by only controlling variables such as clinical and educational factors, the outcome – professional development – might not be the same.

The professionalism and professional development could be better taught to healthcare professionals by increasing the robustness of methods of [medical] education. We may need to ensure that a professional course also contains lessons on the social and culturally-sensitive disease-related issues to better prepare the healthcare students for their future professional duties. A healthcare student, for example, might need to learn about the marginalized populations' rights to health (369); while also learning about the predicaments of having myopic views on issues like sexuality, culture, religion, etc. A healthcare student might need to know that holding negative attitudes towards PLWHA because of conservative views on sexual life style, cultural norms, and religious personal values would negatively affect the

quality of their professional care towards HIV/AIDS patients. The robustness of a formal health education heavily relies on the idea that the healthcare students are not only influenced by the professional course; but also, by the social forces.

7.4.2 Absence of bifurcation of social attitudes of healthcare students

Paradoxical to the idea of bifurcation of HIV/AIDS-related stigmatizing attitudes proposed by Ahmadi *et al* (201); and contrary to the findings of *Study I*, the findings of *Study II* did not show the divergence of HIV/AIDS stigmatizing attitudes amongst pharmacy students. Moreover, Monash University pharmacy students showed a decline in the personal and professional HIV/AIDS-related stigmatizing attitudes. In contrast, USM pharmacy students showed increasing stigmatizing attitudes. The absence of bifurcation of stigmatizing attitudes among the undergraduate pharmacy students confronts the hypotheses that were confirmed in *Study I.*

Year as a proxy for professionalism in pharmacy curricula

Absence of bifurcation of stigmatizing attitudes in *Study II* could be related to the pharmacy curricula. The duration of clinical attachment in the pharmacy curricula of Monash University and USM is extremely shorter than the medical curricula. The pharmacy students in both universities take their experiential learning modules in the final year of their course for a period of not more than three months (295,296). It seems, the unproportionate ultra-short experiential learning (3 months out of 4 years) does not provide enough contact between pharmacy students and real patients in real healthcare settings, which eventually does not allow a visible professionalization of pharmacy students' stigmatizing attitudes.

Furthermore, it might be overstretching to expect the professionalization of stigmatizing attitudes in undergraduate pharmacy students of a traditional pharmacy degree program in which for the first 2-3 years of a 4-5 year program a student is taking basic biomedical sciences type courses. One might ,rightfully, ask that how does two or three years of organic chemistry, physical chemistry, pharmaceutics, etc. equate to "professionalization"? Hence, using *year* as proxy for measuring professionalism in pharmacy curricula might not be as suitable as it is in medical curricula.

Pharmacy curricula and professional development

One may, reasonably, speculate that the Monash pharmacy [hidden] curriculum had contributed to the reduction of the HIV/AIDS-related stigmatizing attitudes of the students. Nonetheless, other possible explanations are the effects of differences in admission processes of the two universities, or the effects differences in the kind of students attracted to the pharmacy programs of the two universities.

The observed difference in stigmatizing attitudes of Monash University students and USM students, could be also explained by Gordon Allport's "*intergroup contact hypothesis*" (370). Allport proposed that the contact between the different members of the same group can have positive consequences like reduction in prejudice and promoting tolerance (370). With this, the less stigmatizing attitudes of Monash University students could be related to the Australian culture and the set of values that different pharmacy students had shared with each other. Eventually, the contact between Monash University students might have resulted in reducing prejudice and HIV/AIDS-related stigmatizing attitudes. Therefore, [hidden]

curriculum might have not been the real modifier of stigmatizing attitudes of Monash University students.

Similarly, we also need to be cognizant of the fact that professional education, the hidden curriculum and professional socialization compete with broader social forces such as cultural norms, practical wisdom (phrenosis) (305), TV shows, media, etc. in forming and shaping stigmatizing attitudes of healthcare students.

Referring to the findings of *Study II*, a need to homogenize pharmacy education across the countries, seems inevitable (319). Prior to becoming functional member of healthcare team, pharmacists and educators need to reach consensus on defining, teaching and monitoring concepts such as professionalism and professional development. The consensus should be reached not only by the pharmacists but also by involving other members of healthcare team such as nurses, doctors, etc.

Pharmacist ,more often than not, have been recognized as underutilized members of healthcare team (315,316). Despite of all its shortcomings, pharmacy education, has been challenged to encourage shared vision and common strategy, for a global transformation in health professional (pharmacy) education (317–319). Involvement of pharmacist in primary care settings is a reality now (371–373), and pharmacist-based interventions in primacy care settings have improved patient outcomes (374,375). Future scenario of responding to symptoms and provision of care centres around the involvement of pharmacists as the first port of call for client/patients (376). That is pharmacists shall work alongside nurses and medical doctors to deliver high quality care to the patients. Therefore, it is crucial to ensure the effectiveness of professionalization processes in reducing the stigmatizing

attitudes of pharmacy students towards the marginalized population. The idea of pharmacist being second in line to the nurses and medical doctors is obsolete and is dangerously detrimental to the training of the future pharmacists.

We would like to propose, to those established schools of pharmacy with clinically-focused pharmacy curriculum, to share their experiences with the schools of pharmacy with traditional pharmacy curriculum. Although, one may possibly argue that the need to homogenize pharmacy education across countries is cliché; the findings of *Study II* hints at the need to homogenize pharmacy education. A pharmacy education that is thoughtfully-balanced to integrate science, practice, teamwork and respect for other healthcare professionals to produce pharmacists who are integrative thinkers and team players (377).

These findings could point us towards the direction of consolidating the importance of strengthening the authority of *fitness to practise* committees and working groups to ensure the quality of healthcare delivery by identifying the unfit healthcare students regardless of their academic merits before they graduate and join the healthcare team (305). One approach to identifying unfit students is to periodically assess the professional development of healthcare students in relation with their professional attitudes – and preferably behavior. For example, to measure the professional domain of an attitude on sensitive issues like sexuality and disease or disease-related stigma in comparison with the personal domain of the same attitude. A healthcare student is fit to provide care if they hold no stigmatizing attitudes or at least they don't allow their personal stigmatizing attitudes interfere with their professional duties.

7.4.3 Stigmatizing attitude change over a defined period of time

Overall, the findings of *Study I* confirmed our hypotheses. However, it is crucial to be reminded that the findings were derived from undergraduate healthcare students of Monash University in a one point-in-time fashion. Thus, to further explore the impact of professional development on stigmatizing attitude change, and factoring in the time constraints of a PhD work, we studied each cohort at two point-in-time i.e., at the beginning and at the end of the academic year. *Study III*, aimed at longitudinal analysis of relationships between professionalization process and stigma change over a relatively short period of time i.e., 6 months.

Recall, one of the hypotheses was that the levels of disease related stigma among healthcare students will decrease significantly with increasing levels of professionalization. To test this hypothesis, within cohorts, we also utilized the comparison between the beginning and end of academic years to further explore the changes in stigmatizing attitudes throughout undergraduate training of each cohorts over a 6-month period. *Study III* was conducted in a two point-in-time fashion. We explicate the reasons why bifurcation of social attitudes was absent at the end of the 6-month period; and why bifurcation of stigmatizing attitudes existed at the beginning of the 6-month period. (Refer to discussion section of *Study III*)

It seems that attitudes of healthcare professionals fall along a continuum of attitude change from professionalization to deprofessionalization/ reprofessionalization (378–380). The changes in the attitudes are associated with variety of factors such as acquiring new knowledge, interaction with peers, [occupational] stress, burnout, working environment, anxiety, etc. (334,337,340,343,381).We speculated that anxiety, stress and burnout had negatively

affected the professional attitudes of the students at the second point of data collection in *Study III*

In *Study III*, we observed an increase in professional stigmatizing attitudes over a relatively short time period. The continuum of attitude change is said to have two ends i.e., a) genuine attitude change, b) temporary position shifts (382). Genuine attitude change involves cognitive processes of issue-related arguments that are usually long-lasting and can have predictable behavioral implications (383). Temporary position shifts, however, appear without conscious or issue-related argumentation. Temporary position shifts are short-term that they disappear when the individuals no longer receive attitude change messages (384). In the context of this study the attitude change stimuli could be of two types i.e., stimuli causing positive changes vs. stimuli causing negative changes. The positive attitude change stimuli, for example, are the professionalization processes such as learning competencies, learning the code of ethics and professional conduct, etc. The negative attitude change stimuli are the stressful environment, burnout, and anxiety during the exam time, etc.

Thusfore, it is important to correctly interpret the changes in professional attitudes of the students as either ‘genuine attitude change’ or ‘temporary position shifts’. We think the latter is possibly a more appropriate interpretation because the likelihood that attitudes will change is greater if the time period separating the two measures is longer (382,385). However, we should not connive at the fact that the negative changes of professional stigmatizing attitudes in this study, could be a genuine attitude change. We like to redirect our attention to the selection criteria and entry requirements of health programs because it is proven when an individual’s

personality traits are closely related to the attitude issue, for example, a non-stigmatizing attitude towards PLWHA, changes in the attitude issue – to reduce stigmatizing attitudes – tend to be enduring (382). Therefore, choosing the right candidates may facilitate and expedite the professionalization processes that would eventually translate into the delivery of high quality care to clients/patients.

The findings of *Study III* and how professional attitudes of students had declined in relation to HIV/AIDS might remotely hint at the notions of outcome-based education and competency-based education in health programs. Outcome-based education emphasizes learners and programs (386,387), whereas competency-based curriculum emphasizes pathways and processes of learning and professional development (387,388).

From the outcome-based education point of view, the professional attitudes of students at the point of graduation is the indicative of the expected outcome. Whereas, competency-based education puts a high premium on the trajectories and processes of professional development throughout the program. Do we need healthcare professionals who demonstrate the traits of professionalism at the point of and after graduation, or we need healthcare professionals who constantly improve their professional attitudes throughout the program and continually demonstrate the traits of professionalism at different points of their professional development till the point of and after graduation? We think there is no definite answer to these important questions; and this thesis did not aim at providing a conclusive answer to whether professionalization processes are better implemented via outcome-based curriculum or competency-based curriculum or combination of both. However, the changes in stigmatizing attitudes

One plausible limitation with the findings of *Study III* is the distinctive gap between "measurement" and "experience". The measurement and measuring of "change" using qualitative scaled instruments provides only part of an insight or understanding into the broader phenomenon being investigated i.e., stigma attitude changes. This work is valuable but all work of this sort will have an inherent limitation when it is not complemented by a more explanatory qualitative component to help us adduce the reasons behind the observations.

7.5 Implications of the findings and future research

Based on the main findings of *Study I*, we would like to suggest the notion of bifurcation of stigmatizing attitudes to other researchers as a new approach to further improve our understanding of stigma and its measurement especially amongst [future] healthcare professionals. The notion of bifurcation of social attitudes merits further investigation into the modeling of professional development in relation with disease-related stigma. From a *healthcare* point of view, professionalization is associated with *health professionals* learning to offer a standard package of interventions to *all* clients (139); without holding any stigmatizing attitudes personally or professionally. Moreover, the notion of bifurcation of stigmatizing attitudes might help the medical educationists to devise innovative methods to measure professionalism in healthcare professionals.

This study yielded a validated measurement tool that could capture the bifurcation of stigmatizing attitudes of healthcare students i.e., branching off the personal attitudes vs. the professional attitudes towards PLWHA. The measurement tool was used to measure the bifurcation of stigmatizing attitudes of undergraduate dental students in two Iranian universities. The tool showed acceptable psychometric

properties and high reliability (Unpublished data). We strongly encourage the researchers to use this measurement tool to investigate the bifurcation of stigmatizing attitudes in healthcare professionals of different disciplines to further examine and improve the validity and reliability of the measurement tool.

Based on the main findings of *Study III*, we also feel the urgent need for conceptualizing and operationalizing interprofessional learning/interprofessional education in health programs. Teamwork among healthcare professionals is essential for the provision of high quality care in healthcare settings (351,389–391). Healthcare students from different disciplines, more often than not, do not get the chance to work together as a team until they graduate and join the workforce in healthcare settings. Recall, the healthcare students of different disciplines have different personality characteristics and professional training. Thus, they professionalize to become healthcare professionals who are supposed to work towards a common goal i.e., provision of care, while having different professional identity and professional attitudes. Similarly, the findings of this study hints at the differences in stigmatizing attitudes of the Monash pharmacy students compared with the Monash medical students.

Interprofessional learning might be considered as one of the possible methods to the quiver of methods available to health educationists to overcome the differences in professional domain of stigmatizing attitudes of healthcare professionals. Interprofessional education improves the healthcare students' attitudes towards knowledge sharing, collaborative learning, team-work and professional identity (55,392). Although, the interprofessional learning culture takes time to become integrated in healthcare professionals' day to day practices (393),

interprofessional education is one of the possible methods to consolidate professionalism; and to foster professional development in healthcare students.

To conclude, from the main findings of *Study III*, we would like to encourage the conduct of longitudinal analysis of healthcare students' professional attitudes/behavior throughout the course of professional development and after graduation. We need more data on the professional attitudes change of healthcare students to better understand the processes of professional development. It is important to produce healthcare professionals who demonstrate high levels of professionalism at the point of graduation, however, it is more important to monitor the processes of professionalization to identify the gaps in the current health education and to suggest pragmatic remedies to overcome them.

7.6 Strengths and weaknesses

The strength of this PhD project is the two-point in time longitudinal design that enabled us to investigate the relationship between stigmatizing attitude towards PLWHA and professionalization by looking at change(s) in attitudes over a time period.

The approach to sampling, which was not ideal but a constraint placed by ethical requirements raises the possibility of a selection bias. In a more general invitation to participate given to all students, those with particular attitudinal dispositions (or dispositions to change attitudes with professional exposure) might self-select. This needs to be noted as a limitation, and may warrant further study. However, the nature of the hypothesis, that participants will change on one dimension of stigma attitudes but not another, seems to provide some protection

against the plausibility of the selection bias as an explanation for any observed difference.

The lack of universally accepted measure of "professionalism"(43,65,163) in healthcare students or the healthcare workforce is an issue. However, within the context of this study, the interaction between years of study and type of stigmatizing attitudes was a reasonable indicator in the first instance.

Moreover, the bifurcation of social attitude into the private and professional domains might have been less distinctive than anticipated, and require larger samples to detect the differences. We also acknowledge to collecting the self-reported attitude rather than the actual attitude and this of course would also raise questions about the practical importance of the issue, which could be a finding in its own right.

7.7 Conclusion

Researchers have applied variety of techniques to study professionalism, ways on how to teach it; and ways on how to measure it. One new method of measuring professional development in health professions students could be through measuring disease-related stigmatizing attitudes. We chose HIV/AIDS as a case study to investigate the relationship between levels of stigmatizing attitudes and professionalism. The approach was successful not only because we could prove the presence of bifurcation of stigmatizing attitudes; but also we could show that professional attitudes are under constant change. The idea of professional attitudes being constantly challenged by variety of the factors such as personal moral convictions, could provide us a new arena in which we could embed professionalism with stigma to further explore both concepts.

Professional development in healthcare should be considered as of the easiest solutions to fight disease-related stigma; to support marginalized populations rights to health; and to upholding *Human Rights* (394,369) . Future health professionals as the *Guardians of Health* need to be trained not only to be clinically fit for the practice; but also to be socially responsible for the well-being of *all* of the members of the society.

During my PhD, the world witnessed Syrian civil war and torture of those health professionals who cared for the patients whom government wanted dead; and also the most recent Ebola outbreak and altruistic involvement of very few health professionals who put their lives on the line to save others (395,396).

It seems that we may need to redirect our attention to the very basics of health education from two main points of view: 1) To reform our current health education and rethink how health educators could train healthcare professionals equipped with more altruistic and risk-taking attitudes; 2) To reevaluate our current entry requirement criteria for health programs.

Current health curricula mainly capitalize on the concept of outcome based education; with the focus on the wellbeing of the patient as the desired outcome. On contrary ‘values-based practice education supports clinical decision making with respect for patient’s personal values (397,398). Values-based practice primarily respects the person who has a health condition; and then focuses on the health condition of the person. Values-based practice trains the healthcare professionals to be more considerate and more receptive about the moral convictions of their patient.

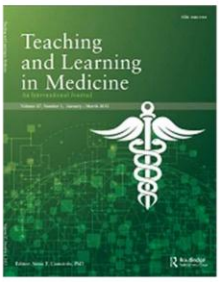
In order to inculcate genuinely altruistic attitudes and behaviors in healthcare professionals, we also need to train the right candidates who have both high intelligence quotient (IQ) and high emotional quotient (EQ) (399). A responsive healthcare system needs healthcare personnel with extremely high levels of altruism and risk-taking attitudes and behaviors. Intelligent, high achiever and studious individuals who have commendable clinical skills may not necessarily have social and interpersonal skills needed to combat epidemics like HIV and outbreaks like Ebola.

A healthcare professionals who is able to respect the personal values of his/her patient; not only, is able to perform his/her professional duties; but also, is able to be blind to his/her personal moral mandates. Altruism as one of the traits of professionalism is, in fact, the art of being able to put someone else before self; while performing the professional responsibilities.

Appendices

8.1 Appendix I: (Study I)

Teaching and Learning in Medicine: An International Journal



Divergence in the professional and personal attitudes of medical and pharmacy students towards people living with HIV/AIDS: A study of professionalism

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Divergence in the professional and personal attitudes of medical and pharmacy students towards people living with HIV/AIDS: A study of professionalism

Abstract

Theory: Professional codes of practice in healthcare typically highlight the primacy of the patient's needs above other considerations. Unfortunately, the literature is rife with counter-examples of healthcare practitioners providing variable forms of treatment because of some perceived moral failing of the patient.

Hypotheses: We hypothesized that over the course of a modern healthcare degree, the process of professionalization should (a) be observable in terms of attitudinal changes towards a marginalised group, and (b) there would be a bifurcation between personal and professional attitudes.

Methods: Cross sectional data were collected during 2012-2013 academic year, using a survey tool consist of items to measure HIV/AID-related stigmatizing attitudes from a professional view and a personal view. Multivariable marginal models were developed to determine the association between stigma and variables such as knowledge, program, year, etc.

Results: Five hundred and eighty nine undergraduate medical students and 218 undergraduate pharmacy students (N=807) participated in the present study. Predictably, year had a significant moderating effect on stigma i.e., for every year spent in the programs the stigmatizing attitudes had decreased.

Conclusion: The idea of bifurcation of HIV/AIDS-related stigmatizing attitudes was proven amongst the participants. This study eventually lays the foundation for further investigation into the professionalization of disease-related social attitudes.

"The health of my patient will be my first consideration." [1]

Professional codes of practice in healthcare typically highlight the primacy of the patient's needs above other considerations. The World Medical Association's Declaration of Geneva, quoted above, is one of the most succinct and well known affirmations of this idea. More often than not, however, this affirmation does not hold true in practice. Patients can be "worthy" or "unworthy", "admirable" or "hateful" [2–4], and the challenge of ethical and professional practice is that all of them must be treated the same – according to their need.

Unfortunately, the literature is rife with counter-examples of healthcare practitioners providing variable forms of treatment because of some perceived moral failing of the patient [5–7]. The HIV epidemic provides a classic case in point. People living with HIV/AIDS (PLWHA) were (and often still are) systematically stigmatised, provided sub-standard treatment, or refused treatment entirely [8,9]. Increasing professionalism among the healthcare practitioners is seen as one mechanism for improving the treatment of the "undeserving" within the health system [10,11]; making the system blind to the social, clinically irrelevant characteristics of the patient. Supporting this idea, there is evidence to suggest that improving these stigmatising attitudes of healthcare professionals improves care [12].

Becoming a healthcare professional and not simply a healthcare practitioner, however, is not an epiphanous event. There is no moment at which one becomes a professional, neither at the commencement of a degree, nor at graduation, nor at some later time. Rather, professionalisation is a process that starts at during training and continues throughout the career [13].

There has been considerable research looking at the attitudes of healthcare students and practitioners towards different patient and social groups; either implicitly or explicitly exploring the professionalism of healthcare practitioners [14–19]. One of the difficulties with much of the research, however, is that a distinction is not made between a professional attitude and a personal attitude. A

professional attitude relates to the treatment and care of patients and one's role within a healthcare system. A personal attitude relates to the private and every day, outside one's role as a healthcare practitioner. For example, for professional purposes I may be blind to the fact that a person is a drug dealer when treating their myocardial infarction, but would be less forgiving in a personal setting if there is some indication that they are joining my social circle.

Addressing the relationship between professional and personal attitudes, Ahmadi *et al*. had previously hypothesised that over the course of a modern healthcare degree, the process of professionalisation should (a) be observable in terms of attitudinal changes towards a marginalised group, and (b) there would be a bifurcation between personal and professional attitudes [20]. That the social attitudes of health students would diverge over the personal and professional domain, it arises, they argued, as a consequence of the new norms of the profession being acquired. As a student learns more about the norms of the healthcare profession code of ethics and professional conducts – and he or she tries to reconcile the expectations of the profession against personal norms a disharmony may be created which is only resolvable with the development of profession-specific, context specific attitudes.

It is hypothesised that across cohorts of health students, those cohorts further advanced in their courses would hold more positive attitudes towards a socially marginalised group than would more junior cohorts; i.e., with increasing professional development, negative attitudes reduce. Furthermore the negative attitudes would decline more rapidly when associated with a clinical/professional context than they would in a personal context; i.e., there would be an interaction between the seniority of the cohort and the context in which the social attitude was measured.

METHODS

Cross sectional data were collected from undergraduate students studying Pharmacy (a 4 year program) and Medicine (a 5 year program) at Monash University. People living with

HIV/AIDS were used as the as the example of a socially marginalised group [17].

Participants

Five hundred and eighty nine (589) medical students and 218 pharmacy students (N=807) studying at Monash University campuses in Malaysia and Australia participated in the present study from all years of the degree program i.e., four years in Pharmacy and five years in Medicine. The course material and curriculum in Australia and Malaysia is the same, except for the contextualisation of examples (see Table 1). The small numbers of 5th year medical students participating in the study reflected the nature of the program. In the final year of medicine students are spread across a large number of hospitals and they are harder to contact and less responsive to requests to participate in research.

Insert Table 1 here.

Procedure

A survey was distributed to undergraduate pharmacy and medical students of Monash University. The survey contained (i) demographic questions, (ii) a purpose developed, validated scale for measuring HIV/AIDS related stigmatizing attitudes from a professional perspective (Cronbach's alpha=.83), (iii) a purpose developed, validated scale for measuring HIV/AIDS related stigmatizing attitudes from a personal perspective (Cronbach's alpha=.89) and (iv) the validated scale for measuring attitudinal knowledge of HIV transmission (Cronbach's alpha=.66). (See Appendix)

The survey items were designed as such to capture the interplay between a social –either professional or personal - responsibility and a potentially stigmatised (HIV positive) or non-stigmatised (HIV negative) characteristic. The respondents' unwillingness to interact with PLWHA or to provide care to them indicated the stigmatizing attitudes, hereinafter referred to as 'stigma'. An example of an item from the professional scale was "A colleague working as a doctor in the

same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive Doctor should have her/his position terminated." An example of an item from the personal scale was "Would you discourage your sibling from becoming friends with an HIV/AIDS person?" In both cases, students were required to respond on a five-point rating scale. A high score represented "no HIV/AIDS-related stigmatizing attitude" and a low score represented "HIV/AIDS-related stigmatizing attitude". Further details of the scales are provided as an Appendix.

Statistical Analysis

The hypotheses related to a repeated measures, 2x4 factorial design (type of stigma x cohort) for pharmacy students; and a 2x5 factorial design for medical students, with various covariates including gender, program of study, campus location (site), and knowledge of HIV.

A generalized estimating equation (GEE) approach was used to test the change in stigma levels across the cohorts. GEE is a regression technique that is widely used to model the population-average estimates with clustered data [21]. Clustering in this case arose because each student contributed a personal stigma score and a professional stigma score.

Outcome

The outcome was the measure of the HIV/AIDS-related stigmatizing attitude. Each participant contributed one personal measure and one professional measure resulting in a repeated measure of HIV/AIDS-related stigmatizing attitudes within each participant. To ensure that the personal and professional attitudes were measured on the same metric, the stigma measures were rescaled to z-scores; i.e., they each had a mean of zero and a standard deviation of one [22].

Predictors

One of the predictors was the professional development that was operationalized in terms of years of study in a professional healthcare program. The other predictor was the context in which the HIV-AIDS related stigma occurred. That is, the attitudes of health students towards people

living with HIV/AIDS (PLWHA) in the context of working environment in a healthcare setting, referred to as professional stigma; and the attitudes of health students towards PLWHA in a private situation referred to as personal stigma.

Covariates

The covariates in the analyses were the participant's gender, their level of HIV knowledge, the healthcare program (pharmacy vs. medicine), the university site (Malaysia vs. Australia).

Two multivariable regression models were estimated using GEE method. Base model was developed with the following covariates: knowledge; program; site; and gender. Model 1 extended the Base model by the predictors i.e., year and type and the interaction between year & type.

The goodness-of-fit of each of the two regression models was tested using Quasi-likelihood under the independence model criterion (QIC). The analyses were conducted in the R statistical software environment [23–25]. GEE modeling was carried out using the geepack package [23–25]a and the model selection tests were performed using MuMIn package [26].

RESULTS

Results of bivariate analyses of the relationship of stigma, knowledge, program, site, gender, year [of the study] and type [personal and professional view] of HIV/AIDS-related stigmatizing attitudes are presented in **Error! Reference source not found.**. Stigma was affected positively - decreased- by all of the covariates and the predictor. With the exception of gender, the covariates and the predictor had a statistically significant effect on stigma. For instance, knowledge and year[s] spent in a program (either pharmacy or medicine) significantly reduced the stigma (0.20, $p<.001$ and 0.16 $p<.001$). Of all covariates, maximum reduction in stigma was associated with program and site (0.51, $p<.001$ and 0.29, $p<.001$) respectively.

Insert Table 2 here.

Expanding upon the outcomes from the bivariate analyses two multivariable marginal models were developed. (See Table 3)

Base model shows the estimation of stigma accounted for by knowledge, program, site and gender. The results were consistent with the bivariate analyses; and showed significant associations with stigma, although the multivariable analysis revealed smaller effects. Moreover, gender had a small and non-significant effect on stigma similar to the result of bivariate analyses. Confirming the results of bivariate analyses in Model 1 all of the covariates except the gender had a significant effect on stigma.

Multivariable analysis revealed smaller effects except for the covariate 'type'. For instance, the size of moderating effect of program in bivariate analysis was reduced from 0.51 to 0.38 in Model 1. Visual presentation of Model 1 shows less professional stigmatizing attitudes compared with the personal stigmatizing attitudes in male Malaysian medical and pharmacy students. (See Figure 1)

Predictably, 'year' had a significant moderating effect on stigma in Model 1. Although the size of effect was smaller compared with the bivariate analysis, but for every year spent in the programs the stigmatizing attitudes decreased by 0.07.

Bifurcation of HIV/AIDS-related stigmatizing attitudes

Visual presentation of Model 1 shows the bifurcation of social attitudes over the years. The interaction between type & year was significantly associated with stigma in Model 1. As expected, Models 1 portrayed the concept of dual loyalty [27,28] and confirmed the bifurcation of social attitude hypothesis proposed by Ahmadi *et al* [20]. (See Figure 1)

The goodness-of-fit of models was tested using Quasi-likelihood under the independence model criterion (QIC). Smaller the QIC better is the model [29]; hence Model 1 best described the data.

Insert Table 3 here.

Insert Figure 1 here.

DISCUSSION

The fundamental finding was the 'bifurcation' of HIV/AIDS-related stigmatizing attitudes amongst healthcare students. As healthcare students became more professionalized their HIV/AIDS-related stigmatizing attitudes diverge across two domains:

1- The professional domain in which the behavioral intentions towards PLWHA are work related in a health working environment.

2- The personal domain in which the behavioral intentions towards PLWHA are at personal levels and in private situations.

The HIV/AIDS-related stigmatizing attitudes, showed a significant –although small- decline for every year spent in the health programs i.e., pharmacy and medicine. The decline in the HIV/AIDS-related stigmatizing attitudes indicates the professionalization of HIV/AIDS stigmatizing attitudes amongst [future] healthcare professionals.

On average the HIV/AIDS stigmatizing attitudes in the professional domain declined faster than the HIV/AIDS stigmatizing attitudes in the personal domain. A steeper decline in the professional domain of stigmatizing attitudes, further, supports the professionalization of HIV/AIDS stigmatizing attitudes.

As professional development occurs, the profession would demand from its professionals to select, improve, and prioritize the knowledge, the routines, and the capabilities. Hence the very basic strategy of being professional is to apply and operationalize all of the learned routines. Provision of standard and ethical care to HIV positive patients is one of the learned routines that results in reducing the HIV/AIDS-related stigmatizing attitudes as one becomes more professionalized. However, these routines may not –and are not meant to- affect the deeply seated personal morals as one becomes more professionalized.

'Site' (Malaysia vs. Australia) was significantly associated with stigma. Site may well

reflect the contextual differences between Australia and Malaysia in the social constructs, cultural beliefs and perceptions of HIV/AIDS as a disease [30–34]. The healthcare students of Australian campuses showed less stigmatizing attitudes compared with the Malaysian counterparts. We speculate that in Australia the HIV/AIDS-related social context, family assessment traditions, the interactional dynamics might have contributed to favorable and less stigmatizing attitudes of healthcare students towards PLWHA.

Different health programs train the healthcare professionals according to the job descriptions of that profession. The job description and the nature of interaction with PLWHA, significantly varies among healthcare professionals. It is shown that the fear of casual contagion and the fear of occupational exposure are associated with the stigmatizing attitudes of healthcare professionals [35–37]. In the process of professional development, knowledge is increased by obtaining information and attaining skills and expertise. Hence, the knowledge seems to decrease the stigmatizing attitudes as the increased personal and social distancing is mainly due to anxiety about the infection [37]. In this study, on average the medical students showed significantly less stigmatizing attitudes compared with the pharmacy students. We speculate the difference is because of more knowledge and more clinical exposure –specially year 3,4 and 5- of medical students.

A profession is an occupation based on specialized training for the purpose of rendering ethical and specialized service(s) for a fee [38,39]. Theoretical work on the professions in sociology acknowledges the wealth characteristics of professions but has looked more broadly at the social role of the professions [40]. Most sociological works on professions highlight, in addition to the economic aspects, issues of ethics, standards and conduct [41].

From a healthcare point of view, becoming a professional is associated with healthcare professionals offering a standard package of interventions to all clients, and a concern with the protection of title, ethics and quality of practice, and job boundaries [41]. A [future] healthcare professional learns more about the norms of health profession i.e., code of ethics and professional

conducts; and continually tries to justify the moral values of the newly acquired professional attitudes against the culturally-sanctioned personal attitudes. For instance, a [future] healthcare professional may have learnt to disapprove of 'homosexuality' in an HIV positive person; but may have also learnt to provide an ethical and standard care to an HIV positive patient in a health setting.

When a future healthcare professional is encumbered by his/her personal attitudes towards PLWHA, his/her professional attitudes might be periodically jettisoned to combat dissonance between the professional and the personal attitudes. One could suggest that the bifurcation of the HIV/AIDS-related stigmatizing attitudes of [future] healthcare professionals is the aftermath of a mental juggling between the personal and the professional norms.

This research brings into stark focus a dilemma faced by many other professions required to provide close contact front line service to the public, in split of strong personal attitudes. Recent examples include, for instance, discussion of racism interfering with police practice in the US [42]. The question, therefore, is that could a concerted effort put into the process of professionalization during the training period help to address not only the practice –which is a competency based outcome of training; but also the personal attitudes of the practitioners?

Limitation

A plausible limitation is the mapping of attitudes to behavior, where a respondent's self-reported attitude may not be congruent with current or future behavior. An important step in the future research would be a behavioral analysis of healthcare professionals. A second limitation, again common in this kind of research, relates to the limited respondent pool from which participants were drawn. A third limitation is the magnitude of effects that appeared to be small, although they were statistically significant. The generalizability of these findings needs to be established in healthcare professional and healthcare professionals in training.

Conclusion

The key finding of this study was the idea of bifurcation of HIV/AIDS-related stigmatizing attitudes of [future] healthcare professionals. This study eventually lays the foundation for further investigation into the professionalization of disease-related social attitudes. Although these findings suggest that the GEE modeling techniques were successful in determining the association between stigma and other variables among study population, but the generalizability is yet to be established.

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Table 1 Description of the study population

		Program	
		Medicine	**Pharmacy**
Age		Mean age = **21.2** yrs, SD = **2.5**	Mean age= **20.8** yrs, SD= **2.1**
Gender			
	Male	**252** (31.2%)	**55** (6.8%)
	Female	**337** (41.8%)	**163** (20.2%)
Site			
	Malaysia	**369** (45.7%)	**167** (20.7%)
	Australia	**220** (27.3%)	**51** (6.3%)
Year			
	Year 1	**137** (23%)	**59** (27%)
	Year 2	**105** (18%)	**60** (27.5%)
	Year 3	**156** (27%)	**48** (22%)
	Year 4	**137** (23%)	**51** (23.5%)
	Year 5	**54** (9%)	**Not applicable**

Note.- Total number N = 807

Table 2 Bivariate analysis of the relationship between stigma and covariates

Variable	Stigma			
	β[1]	SE[2]	p	95% CI[3]
Covariates:				
Knowledge	**-0.20*** **	0.022	<.001	-0.24 – -0.16
Program (base=pharmacy)	**-0.51*** **	0.067	<.001	-0.64 – -0.38
Site (base=Malaysia)	**-0.29*** **	0.070	<.001	-0.42 – -0.16
Gender (base=Female)	-0.02	0.061	0.95	-0.10 – 0.14
Predictors:				
Year (base=First year)	**-0.16*** **	0.023	<.001	-0.20 – -0.12
Type (base=Personal)	**-0.14*** **	0.030	<.001	-0.20 – -0.08

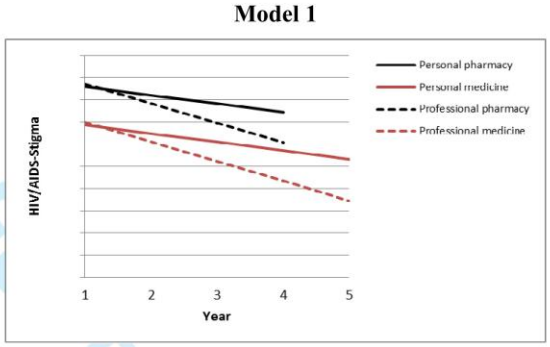
1- Parameter estimate coefficient, 2- [Robust] Standard Error, 3- Confidence interval, *** p <.001

Table 3: Model estimates of stigma using GEE approach (multivariate analyses of stigma)

Variable	Base Model				Model 1			
	β[1]	SE[2]	95% CI	p	β[1]	SE[2]	95% CI	p
Covariates:								
Knowledge	**-0.16** ***	0.02	-0.20 – -0.16	<.001	**-0.14****	0.02	-0.18 – -0.10	<.001
Program	**-0.38** ***	0.07	-0.51 – -0.25	<.001	**-0.35****	0.07	-0.48 – -0.22	<.001
Site	**-0.19****	0.07	-0.32 – -0.06	<.01	**-0.19****	0.06	-0.30 – -0.08	<.001
Gender	0.04	0.06	-0.07 – 0.15	0.49	0.02	0.06	-0.09 – 0.13	0.69
Predictors:								
Year	-	-	-		**-0.07****	0.02	-0.11 – -0.03	<.01
Type	-	-	-		**0.12** ˙	0.07	-0.01 – 0.25	<.1
interaction:								
Type: year	-	-	-		**-0.10****	0.02	-0.14 – -0.06	<.01
QIC[3]			-318				-380	

1-Parameter estimate coefficient, 2- [Robust] Standard Error, 3- Quasi-likelihood under the independence model criterion, *** p <.001, ** p <.01, * p <.05, ˙ p <.1

Figure 1 GEE Model



Appendix

HIV/AIDS related stigma scale (Personal perspective)

Item Nr.	Item
1	People with HIV should **NOT** be bus drivers.
2	People with HIV should **NOT** be religious leaders.
3	People with HIV should **NOT** be police officers.
4	If you come to know that your friend is HIV positive, would you continue your friendship with him/her?
5	If you come to know that your colleague is HIV positive, would you continue working with him/her?
6	Would you allow your HIV positive friend to use your bathroom?
7	Would you discourage your sibling from becoming friends with an HIV/AIDS person?
8	Would you send your child to a school where one of its teachers is HIV positive?
9	A family has a right to know if a member is infected with HIV and this is more important than a family member's right to privacy.

HIV/AIDS related stigma scale (Professional perspective)

Item Nr.	Items
1	A colleague working as a pharmacist in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive pharmacist should have her/his position terminated.
2	A colleague working as a doctor in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive Doctor should have her/his position terminated.
3	A colleague working as a nurse in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive nurse should have her/his position terminated.
4	Physicians with HIV should be allowed to continue working.
5	Pharmacists with HIV should be allowed to continue working
6	Surgeons with HIV should be allowed to continue working
7	A hospital has implemented a policy of mandatory testing for HIV at recruitment of its cleaning staff.
8	In general it would be better if HIV positive patients were treated in facilities separate from other patients.

8.2 Appendix II: (Mokken paper)

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EMERGING THEMES IN EPIDEMIOLOGY

RESEARCH ARTICLE Open Access

A novel nonparametric item response theory approach to measuring socioeconomic position: a comparison using household expenditure data from a Vietnam health survey, 2003

Daniel D Reidpath[1,2*] and Keivan Ahmadi[2,3]

Abstract

Background: Measures of household socio-economic position (SEP) are widely used in health research. There exist a number of approaches to their measurement, with Principal Components Analysis (PCA) applied to a basket of household assets being one of the most common. PCA, however, carries a number of assumptions about the distribution of the data which may be untenable, and alternative, non-parametric, approaches may be preferred. Mokken scale analysis is a non-parametric, item response theory approach to scale development which appears never to have been applied to household asset data. A Mokken scale can be used to rank order items (measures of wealth) as well as households. Using data on household asset ownership from a national sample of 4,154 consenting households in the World Health Survey from Vietnam, 2003, we construct two measures of household SEP. Seventeen items asking about assets, and utility and infrastructure use were used. Mokken Scaling and PCA were applied to the data. A single item measure of total household expenditure is used as a point of contrast.

Results: An 11 item scale, out of the 17 items, was identified that conformed to the assumptions of a Mokken Scale. All the items in the scale were identified as strong items ($H_i > .5$). Two PCA measures of SEP were developed as a point of contrast. One PCA measure was developed using all 17 available asset items, the other used the reduced set of 11 items identified in the Mokken scale analaysis. The Mokken Scale measure of SEP and the 17 item PCA measure had a very high correlation (r = .98), and they both correlated moderately with total household expenditure: r = .59 and r = .57 respectively. In contrast the 11 item PCA measure correlated moderately with the Mokken scale (r = .68), and weakly with the total household expenditure (r = .18).

Conclusion: The Mokken scale measure of household SEP performed at least as well as PCA, and outperformed the PCA measure developed with the 11 items used in the Mokken scale. Unlike PCA, Mokken scaling carries no assumptions about the underlying shape of the distribution of the data, and can be used simultaneous to order household SEP and items. The approach, however, has not been tested with data from other countries and remains an interesting, but under researched approach.

Keywords: Mokken scale analysis (MSA), Principal component analysis (PCA)

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Background

Socioeconomic position (SEP) has played an important role in many health studies [1-5]. The relationship between SEP and health has been studied in its own right, [6-8] and it has been treated as a potential covariate/confounder in studies of other substantive causes of poor health [9,10]. Typically, the households in such studies are divided into quintiles according to their estimated SEP and then comparisons are made between fifths of the population [11]. Identifying valid, reliable, acceptable, and low cost methods of measuring SEP is an ongoing and important area of research in the health sciences [11-13].

Among the possible measures of SEP, household expenditure is associated with various health outcomes, [14-16] and tends to be preferred by economists [12]. However, in low and middle income countries expenditure data can be difficult to obtain, [11,13]. and common alternatives have been asset-based indices of household wealth that may include access to utilities and infrastructure. A minority view holds that asset-based measures are in fact superior to expenditure based measures of SEP; [17] with others advocating a middle position. Somi et al., for instance, argued that both expenditure measures and asset-based indices should be treated as legitimate proxies of SEP, given that SEP is a latent variable that cannot be directly observed [18]. In a recent, significant (though not fully comprehensive (p.883)) review of socio-economic measures in low and middle income countries, the authors concluded that the research question, the setting, and the available resources needed to guide the choice of approach to the measurement of SEP [19]. While this is undoubtedly true, in many cases, particularly in the secondary analysis of household survey data there is a tendency to fall back on a small handful of techniques that can be readily applied to data over which the researcher had no control during the collection [20,21].

Various approaches exist for the construction of asset-based indices [13,22]. Ubiquitous among these, which is used in this article as a point of comparison with Mokken scaling, is a principal components analysis (PCA) of a parcel of household assets [17,18,20,21]. The PCA approach was famously, although not first described by Filmer and Pritchett [17] and was adopted by the HNP/Poverty Thematic Group of the World Bank as a standard technique in their poverty and equity analyses covering 44 countries; (cf[23-25]). PCA is the approach taken in the DHS Wealth Index; [26] and it remains a common tool in health research today [7,27,28]. The PCA approach in wealth measurement has its early development in the recognition that multiple measures of wealth create analytic problems associated with collinearity, and PCA offers an efficient data reduction technique to extract orthogonal dimensions [29].

In contrast, Mokken scales take as their conceptual starting point Guttman scales [30,31]. A Guttman scale is a set of ordered (increasingly "harder") items. Without formally defining "harder" questions, those households with a higher SEP would respond positively to increasingly "harder" questions, leaving a SEP rank order of respondent households from low SEP to high SEP, with all but the highest ranked households eventually finding some questions "too hard" to respond to positively. For example, a question about car ownership is likely to be a "harder" question than a question about ownership of a bucket. Guttman scales, however, are strictly deterministic and do not allow for error in the measurement.

It is here that Mokken scales differ from Guttman scales. Mokken scales are probabilistic, belonging to the non-parametric item response theory model of scales, and allow for stochastic error in measurement [30]. For each item in an asset-based Mokken scale of SEP, the *probability* of a positive response to a question of asset ownership depends on two factors: the SEP latent trait characteristics of the household; and the item characteristics of the asset ownership question. The higher the SEP latent trait of a household, the greater the probability that the household will respond positively to any asset ownership question – without regard to the difficulty of the question itself. The "harder" the ownership question, the lower the probability that a household will respond positively to the question – without regard to the household. This means that a Mokken scale, asset-based index of SEP can rank order households according to their latent trait, and rank order items according to their probability of eliciting a positive response [31]. A Mokken scale analysis (MSA) identifies those items that can be used to rank respondent households according to their probability of a positive response (i.e. their position on the latent trait of SEP), and it orders items according to their probability of being answered positively. Mokken scales are also frequently shorter than scales developed using other procedures, holding out the promise of more concise measures of SEP. While item response theory approaches have been applied to the measurement of household SEP previously, the application has been in high income countries, and relied on parametric techniques (such as the Rasch model) with stronger underlying assumptions than the nonparametric approach of Mokken scales [32-34].

We illustrate the use of MSA in the development of a measure of household SEP in a low income country setting, and contrast Mokken scaling with and equivalent PCA measure of SEP and with a single item measure of household expenditure. The comparison is made using data from a nationally representative household survey conducted in Vietnam. The analysis of a single data set cannot stand as a robust comparison of a scaling

technique. It can however illustrate the use of a novel approach to SEP measurement; and in the spirit of an "emerging theme" it may motivate further interest and research.

Methods

The World Health Survey was a household survey utilising a uniform methodology conducted in 70 countries between 2002 and 2004 [35,36]. Asset ownership questions were included in the survey at the household level. The household asset data analysed here were drawn from the Vietnam, World Health Survey 2003 [37]. Data were collected from 4,154 of 4,174 consenting households (a response rate of 99.5%) [37]. Approximately 23% of households were urban and 77% rural. Households with incomplete asset ownership data (8.7% of households) were excluded from the analysis, leaving a usable sample of 3,810 households (an effective response rate of 91.3%). The level of missing data was considered small enough not to warrant imputation [38]. The survey included 16 dichotomous questions on household asset ownership, access to utilities and infrastructure, and one continuous response question which was dichotomised for the analysis (Table 1).

Household expenditure was measured with the question: "In the last 4weeks, how much did your household spend in total?"

The data from the World Health Survey are publicly available for analysis as anonymised, unit record files. Ethics Committee approval for the analysis presented here was neither sought nor required.

Data analysis

PCA is a well described technique for developing asset-based indices of SEP and will not be described in detail here [11]. It is nonetheless worth noting that PCA is a statistical technique to reduce the dimensionality of data by identifying sets of weighted linear combinations (principal components) of the original asset measures, such that each new principal component accounts for a smaller proportion of the variance than the preceding components, and that each of the identified principal components are orthogonal [39]. It is the first principal component (accounting for the greatest proportion of the variance) that is typically used to construct an index of household SEP. An underlying assumption of PCA is that the data are continuous and drawn from a multivariate normal distribution [20]. This is not the case with a series of dichotomous asset-ownership questions. However, assuming an underlying continuous, normally distributed latent variable, the polychoric correlation between two observed dichotomous variables can be used as an estimate of the actual correlation [20]. It was the polychoric correlation matrix that was used in the PCA described here.

Table 1 The parcel of goods/items used in the Mokken scale analysis

Item	Proportion[3]	Mokken Scale	H_i[4]
Does anyone in your household have a **bicycle**?	83.96	-	-
Does anyone in your household have more than one **house/apartment**[2]	4.67	-	-
How many **cars** are there in your household?[1]	3.65	-	-
Does anyone in your household have a **clock**	90.47	1	.62 (.019)
Does your home have **electricity**?	90.42	1	.56 (.021)
Does anyone in your household have a **television**	78.53	1	.74 (.013)
Does anyone in your household have a **motorbike**	49.79	1	.70 (.013)
Does anyone in your household have a **video/DVD**[2]	31.57	1	.68 (.014)
Does anyone in your household have a **telephone**, fixed-line	16.72	1	.69 (.013)
Does anyone in your household have a **refrigerator**	15.30	1	.69 (.014)
Does anyone in your household have a **magazine subscription**[2]	7.51	1	.46 (.023)
Does anyone in your household have a **washing-machine**	5.33	1	.59 (.021)
Does anyone in your household have a **computer**	5.04	1	.50 (.026)
Does anyone in your household have a **mobile telephone**	4.33	1	.64 (.019)
Does anyone in your household have a **dishwasher**[2]	0.34	1	.57 (.106)
Does anyone in your household have a **bucket**	84.62	2	.49 (.097)
Does anyone in your household have an **agricultural machine**[2]	8.06	2	.49 (.097)

[1]A continuous item dichotomised as none (0) and one or more (1).
[2]These are "Country Specific" items, which vary from country to country in which the World Health Survey was conducted.
[3]The proportion of households owning each asset.
[4]Standard errors are shown in parentheses.
The final items used in both the Mokken scale analysis and the 11 item PCA are identified as belonging to Mokken Scale 1.

MSA relies on an automated procedure for the selection of items that belong to one or more independent Mokken scales (or no scale at all), and a series of methods to investigate the extent to which the scales maintain the assumptions of a nonparametric item response theory model [40].

A Mokken scale of household SEP is based on four assumptions:

1. *Unidimensionality*. A scale of responses to questions of household asset ownership measures a dominant, single latent trait of household SEP.
2. *Local Independence*. Responses to an asset ownership question are not influenced by the responses to any other asset ownership question in the same scale.
3. *Monotonicity*. The probability of a positive response to an asset ownership question is a monotonically increasing function of the latent trait. This assumption would be violated, for instance, if both low and high SEP households had a low probability of owning asset a_i, but middle SEP households had a high probability of owning asset a_i.
4. *Non-intersection*. If the probability of households owning asset a_i is lower than probability of households owning asset a_k, for one level of the SEP latent trait (e.g., a low SEP household), then it will be lower for all levels of the latent trait (i.e., middle and high SEP households). This is referred to in the literature as *invariant item ordering* or (IIO), and means that the ordering of difficulty of the asset ownership question holds for all households without regard to their SEP [41-43].

In Mokken scaling, the *model of monotone homogeneity* (MMH) is based on the first three assumptions. In its practical application, a household SEP scale meeting the requirements of MMH allows for the ordering of households by the sum of the number of positive responses to the asset ownership questions. The more positive responses, the higher a household's SEP [41,42].

If a scale meets the requirements of the MMH and the scale meets the fourth assumption of non-intersection (or IIO), it also fulfills the requirements of the *double monotonicity model* (DMM). In its practical application it means that not only can households be ordered on the latent trait of household SEP, but the asset ownership questions (items) can be ordered according to how "hard" or "difficult" they are.

There are various methods for testing the assumptions of a Mokken scale. At the heart of the procedures are Loevinger's homogeneity coefficients [44,45]. These are three related coefficients, which are used to select items that contribute to a unidimensional (homogeneous) scale [30,44]. For details, readers are referred to a number of articles and books written on the topic, where for brevity we focus on the conceptual and applied application. [40,43,46,47]. The main coefficients used are H_i and H. The H_i coefficient provides a measure of the scalability of each item *i* that makes up the potential scale, and the H coefficient provides a measure of the scalability of the whole scale (i.e., the degree to which the items always appear in the same relative order) [48]. Guidelines for the interpretation of the coefficients suggest that values of .3 –.4 are indicative of a weak scale (or item), values of .4–.5 are indicative of a medium scale (or item) and values > .5 are indicative of a strong scale (or item) [30]. When the H coefficient is calculated on the transpose matrix of dichotomous asset ownership responses (H^T), one obtains a summary statistic of the accuracy of asset ordering within a scale.

The automated item selection procedure (AISP) partitions a set of items into zero or more Mokken scales and provides summary statistics for the items and scales [46]. This is a necessary but not sufficient procedure for establishing a Mokken scale. For the MMH one needs to establish monotonicity, and for the DMM one also needs to establish the non-intersection assumption, or IIO. There are a number of possible approaches to establishing non-intersection, and in this study, the *restscore method* was used, which compares all possible item pairs to establish whether significant violations of the non-intersection assumption occur [43,46].

All analyses were conducted in the R statistical environment [49]. The analyses were supported by the mokken package for the Mokken scale analysis, [47] and the polycor package for estimating polychoric correlations [50].

Results

Mokken Scale Analysis

Of the 17 items included in the MSA, the automated item selection procedure identified three items which could not be scaled, 12 items potentially belonged to one scale, and two items potentially belonging to a second scale (Table 1).

For the remainder of the paper, the focus is on the 12 items contributing to scale one. The single item scalability coefficients, H_i ranged in value from .46 to .79 with 10 of the 12 items having values greater than 0.5; i.e., potentially "strong" items [30]. The standard errors of each H_i were relatively small, with the exception of the item measuring dishwasher ownership. Indeed, of the 10 items with H_i's indicating strong scalability, only the H_i of the item measuring dishwasher ownership had a 95% confidence interval to include a value less than .5 (i.e., $H_i - 1.96 \times SE = .480$) [47,51]. Importantly, there was no item for which the lower bound of the 95% confidence interval included .3, a conventionally used cut-off to reject potential items as un-scalable [51].

The overall scalability coefficient for scale one, H was .65. There were, furthermore, no violations of monotonicity. However the *rest scores*, used to test the IIO, indicated two critical violations associated with electricity availability and clock ownership. It is recommended that the worst offending item is removed from the preliminary scale and the rest scores re-examined – in this case the item related to electricity availability. Once electricity availability had been removed as an item in the scale, there were no further violations [46].

In keeping with the Mokken scaling approach, the Mokken SEP score was calculated as the unweighted sum of the 11 remaining dichotomous items. Figure 1 shows the distribution of Mokken SEP scores with approximate quintile boundaries. Twenty percent of households had a score of 1 or less, 45% of households had a score of 2 or less, 67% of households had a score of 3 or less, and 82% of households had a score of 4 or less. The households in the top 20% had scores of 5 or more.

Principal components analysis

Two separate PCAs were conducted using different item pools. The first PCA was based on the 17 item asset ownership questions from the World Health Survey. The second PCA was based on the reduced, 11 item pool, identified in the Mokken analysis.

In the first analysis of all 17 items, the first principal component accounted for 51.5% of the variance, the second accounted for 20.8% of the variance, and the third accounted for 9.7% of the variance. After the fourth component, eigen values fell below 1. A scree plot (unshown) indicated no obvious discontinuity or 'elbow' in the declining eigen values. In the second PCA, using the 11-item pool, the first principal component accounted for 24.9% of the variance, the second accounted for 21.6% of the variance, and the third accounted for 14.4% of the variance. After the fourth component, eigen values again fell below 1. The scree plot (un-shown) indicated no obvious discontinuity or 'elbow' in the declining eigen values.

For both PCA analyses, asset scores based on the first principal component were used to create a continuous SEP score, and quintiles.

The Pearson's product moment correlation between the Mokken measure and the 17 item PCA measure of SEP was very high, r = .98, and for the quintiles of wealth, Spearman's rank order correlation was r = .96. The relationship, however, was weaker for the reduced, 11 item PCA measure. The Pearson's product moment correlation between the Mokken-based measure and the PCA-based measure of SEP was moderate, r = .68, and the Spearman's rank order correlation for quintiles of wealth was very low r = .11.

Reliability

Cronbach's alpha was used as a measure of the reliability three SEP scales. The items were weighted prior to the calculation of Cronbach's alpha. They were weighted to ensure that each SEP scale was evaluated based on its adjusted item scores.

In the case of the Mokken scale, the items were unit weighted, because the scale is a simple sum of the asset-based items. In the case of the PCA scales, the items were weighted by the PCA loadings from the first principal

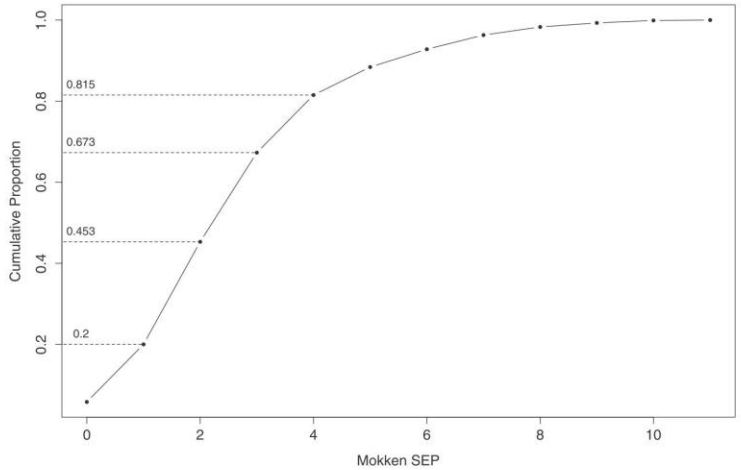

Figure 1 An ogive of the distribution of Mokken SEP scores with approximate quintile boundaries.

component. Cronbach's alpha for the unit weighted 17 item scale was included as a point of contrast.

The reliability of the unit weighted, 17 item scale was .73 (95% CI: .71 – .74). The reliability of the PCA weighted, 17 item scale was .52 (95% CI: .49 – .54). The reliability of the unit weighted, 11 item Mokken scale was .76 (95% CI: .75 – .78). The reliability of the PCA weighted, 11 item scale was .19 (95% CI: .15 – .23). The Mokken scale had a significantly larger Cronbach's alpha than the other potential SEP scales.

Comparisons with household expenditure

The responses to the single household expenditure question from the World Health Survey were log transformed because of the long tail of the distribution that is typical of expenditure and income data. Figure 2 shows a box plot of household expenditure data over the quintiles of household SEP estimated by the Mokken scale analysis (2a), the PCA using all 17-items (2b), and the PCA using the 11 items identified by the Mokken analysis (2c). The distribution of actual household expenditure values in each quintile was overlaid as grey coloured points.

A visual inspection suggests, as might be expected from the close to perfect correlation between the the 17 item PCA quintiles and Mokken scale quintiles, that they perform very similarly (Figure 2a and b). In contrast the boxplot of the 11 item PCA quintiles against household expenditure shows no obvious systematic relationship (Figure 2c).

The Pearson's product moment correlation between the household expenditure data and the Mokken SEP continuous scores was r = .59, for the 17 item PCA SEP continuous scores it was r = .57, and for the 11 item PCA SEP continuous scores it was r = .41. The correlations between the household expenditure and the quintiles data for the Mokken (r = .57) and the 17 item PCA SEP (r = .53) showed similar levels of performance. The correlation between the household expenditure data and the 11 item PCA SEP quintiles was r = .18.

Discussion

Mokken scaling appears to be a promising approach to the development of an asset-based measure of household SEP. The Mokken scale was strongly correlated with the

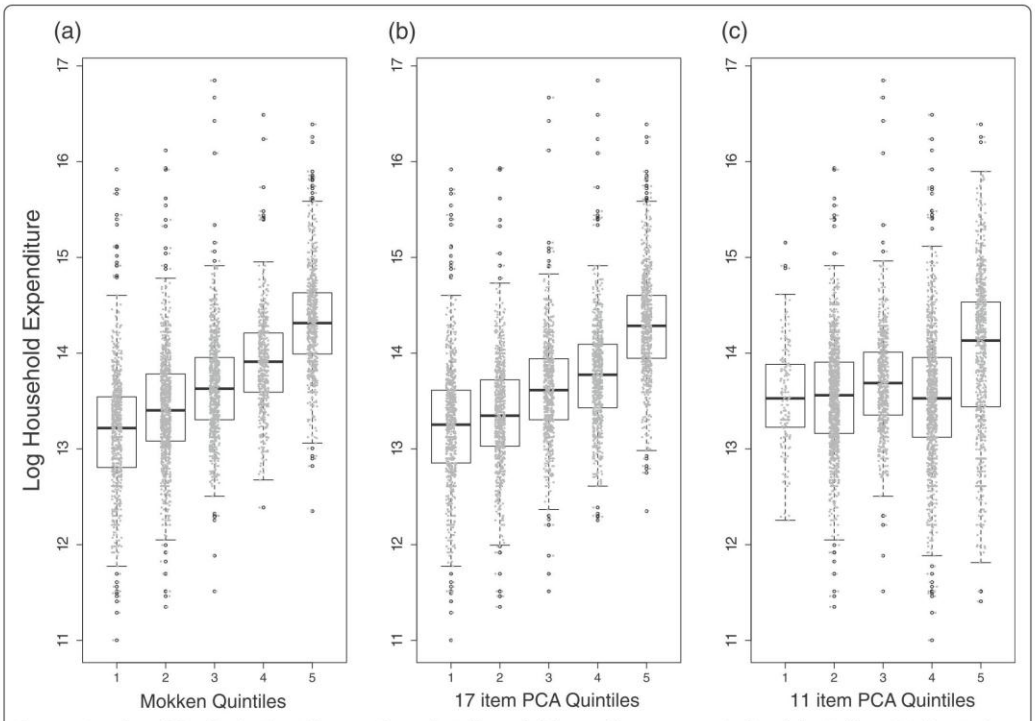

Figure 2 Boxplots of the distribution of log transformed total household expenditure across quintiles of the Mokken SEP (a), a 17 item based PCA SEP (b), and an 11 item based PCA SEP (c).

17 item PCA measure of SEP, and with a significantly better Cronbach's alpha. Both measures performed similarly with respect to the measure of total household expenditure. That measures of asset based SEP and expenditure were moderately correlated supports the general notion of an underlying latent wealth construct, [12,18] and it supports the use, of asset based measures if expenditure measures are desirable but unobtainable.

In sharp contrast to the 17 item PCA, the correlation was much weaker between the 11 item Mokken scale and the 11 item PCA measure of SEP. Furthermore, the 11 item PCA SEP quintiles showed no practical relationship with the household expenditure; and the Cronbach's alpha for the PCA measure was very weak.

A novel feature of Mokken scaling is that it orders items as well as households. Outside the direct value of SEP to health research, it may potentially be used to track changes in items indicative of wealth over time. Hard items today, (i.e., items to which only the wealthiest have a high probability of responding positively) may become easy items in the future, or visa-versa. In 2003 when the World Health Survey data for Vietnam was collected, the market penetration of the mobile telephone was less than 5%, supporting the apparent "hardness" of the item identified in the Mokken scale analysis (Table 1). Mobile phones were a rare and expensive commodity in 2003. In 2012 the market penetration of the mobile phone in Vietnam had exceeded 100%, making it an "easy" item that would not today readily separate the wealth quintiles [52]. The mobile phone as an asset item was highlighted for very similar reasons in a recent Rasch analysis of poverty in Europe (p.69) [32].

Given the growth of interest in item response theory approaches to modelling SEP, [33,34]. the results of the Mokken scaling presented here should pique some interest. Unlike parametric item response theory models, there are fewer assumptions associated with Mokken scaling which can broaden its application. This has been found in other areas of health research where Mokken scaling has been used successfully in its own right, and used to support or check parametric item response theory approaches [53-55].

Limitations

One of the limitations of this analysis relates to the generalisability of the approach; specifically whether Mokken scaling will always perform comparably well or out perform PCA; and whether it will perform as well as other approaches [56]. This limitation, however, needs to be placed in the context of at least one of the paper's goals, which was to illustrate the use of Mokken scale analysis in the context of SEP measurement.

For some the apparent complexity of Mokken scaling over PCA maybe seen as a limitation; indeed, one of the Reviewers of a draft raised this very possibility. We would argue that the apparent complexity is a function of familiarity. Understanding PCA and the underlying eigen values is not trivial. Exposure to a technique creates familiarity. This is the first paper we know of that uses Mokken scaling in the development of an SEP measure. Furthermore, given the emergence of item response theory approaches in SEP measurement, this is well timed and should add another technique to the quiver of methods available to epidemiologists [56].

The use of a single global measure of household expenditure as a comparative measure of SEP is also a limitation. While additional questions could undoubtedly have improved the measure of household expenditure, these were not available, and as so often happens in secondary data analysis, one is constrained by the choices made by the original researchers. It is also known that expenditure data in low income settings can be hard to obtain, which motivated the creation of asset-based measures in the first place. The real problem with single question measures is that they are often very noisy (in a stochastic sense). The fact that both the 17 item PCA measure of SEP and the Mokken scale measure of SEP correlated moderately with the single item measure of household expenditure, however, suggests that the choice was not misguided in this context.

Conclusion

The Mokken scale measure of household SEP performed at least as well as PCA, and outperformed the PCA measure developed with the 11 items used in the Mokken scale. Unlike PCA, Mokken scaling carries no assumptions about the underlying shape of the distribution of the data, and can be used simultaneous to order household SEP and item difficulty. The approach, however, has not been tested with data from other countries and remains an interesting, but under researched approach.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

DDR and KA jointly developed the idea of applying Mokken scaling to the problem of measuring SEP. KA provided technical input on Mokken scaling, DDR conducted the preliminary analysis. DDR and KA jointly drafted and edited the manuscript. All authors read and approved the final manuscript.

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8.3 Appendix III: (Proposal for equitable treatment)

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Training Physicians for a New Health Care Delivery System

To the Editor: The patient-centered medical home (PCMH) provides coordinated, comprehensive, continuing, team-based, and patient-centered primary care as well as population management and accountability for health outcomes. Considerable experience suggests that PCMHs should be the foundation for a reformed care system that improves quality, lowers costs, and meets patients' needs.[1–3]

However, many medical schools and residencies are not yet exposing trainees to PCMHs. Family medicine programs are an exception: Dozens of family medicine residencies have changed their practices into PCMHs and implemented PCMH curricula.[4,5]

But this is just a start. If the nation wants to achieve a higher-performing and more efficient health care system, then medical students and residents of all specialties need to be exposed to and familiar with the PCMH. Primary care physicians (PCPs) should be prepared to work effectively within PCMHs. Non-primary-care physicians must understand the role of PCMHs in reformed delivery systems, such as accountable care organizations, so that they may better coordinate with PCPs in the care of patients.[6]

We urge medical schools and residencies to redesign their primary care practices and curricula to demonstrate and teach principles of the PCMH to physicians of all specialties.

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A Proposal to Help Achieve Equitable Treatment of Transgender People in the Health System

To the Editor: Admonishing health care providers for not giving equitable care to transgender people is a tempting but least-acceptable option if educators and policy makers in the health care professions are not held equally responsible. If health care providers are not appropriately educated, it is from those who so poorly equipped them that we should seek answers.[1] The shortcomings of current health education[2] and the urgent need to take remedial actions to address the sensitive and complex issues pertaining to the real-life health care scenarios of transgender people have been well acknowledged.[2,3]

As a robust solution to the health disparities experienced by transgender people, we suggest a two-step targeted approach where interdisciplinary short-term courses (e.g., four courses over a period of four weeks) on the special needs of this marginalized population are delivered to educators and policy makers by appropriate experts in a problem-based learning format. Following that, complementary short (e.g., a three-hour slot) and more specialized courses could be taught. These would focus extensively on the social determinants of the health problems of the marginalized clients. This targeted approach could not only provide more in-depth understanding of the special needs of transgender people but could also trigger movements to influence national and cultural priorities in favor of this group's right to an equitable health system.

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8.4 Appendix IV: (Professionalism in Health)

IJPP International Journal of Pharmacy Practice

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International Journal of Pharmacy Practice 2015, 23, pp. 92

Letter to the Editor

The health professionals' right to refuse: is it good, bad or ugly?

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The literature is replete with cases in which the health professionals have refused to provide care to their patients; where in some cases such professionals have received disciplinary actions against them for not fulfilling their professional duties.[1–4] However, the health professionals should have the right to refuse to provide care to their patients, for whatsoever reason, without being disparaged or disqualified. A health professional who fails to balance between personal partiality and professional impartiality, upon being compelled to provide care, might provide care with the quality, one could argue, that might not be the *high-quality* patient care.

Our attention needs to be redirected to the basics of professionalism and its institutionalization within self,[5–7] where the pinnacle of professionalism ensues from the interest in provision of service to the patient, while ruminating about one's own personal preferences.[6]

The personal and the professional preferences are under constant change. For example, the professional preferences could be changed under the direct or indirect influence of the profession, professional bodies or the peers.[8,9] Professions favor some traits of professionalism such as tactic knowledge, certain routines and adaptabilities over the other because of the economic profitability.[9] As a result of this, a sense of selectivity is imposed on the health professionals to render those favored services to their clients. Moreover, a health professional may make a decision that is influenced by the actions of a reputable peer, as the decisions made by the professionals are neither routinized nor predictable.[9]

From a global view, a (wrong) decision making and its enactment by a health professional could be multidimensional and could be linked with (1) the profession; (2) the peers; (3) the clients; (4) the training; and (5) the health professional's own morals.[10] Henceforth, if any action has to be taken to reinstitute professionalism, it should be multidimensional and should reasonably address all of the above-mentioned contributing factors.

Declaration

Conflict of interest

The Author(s) declare(s) that they have no conflicts of interest to disclose.

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8.5 Appendix V: (Professionalism in Medicine)

Re: Doctors in Syria are being forced to treat patients in secret, charity says

The medical professionalism is grossly undermined in the current situation in Syria.Cruess et al. described medical professionalism as an idea to be sustained (1) and this cannot be achieved unless there are structural supports available and functional. Creating long list of attributes on medical education and professionalism alone (2) would not do any better in real health work environment or in extra-ordinary situations. Syria is not the first state violating the code of ethics in the medical field and may not be the last. Almost a year ago the World Medical Association (WMA) issued a resolution on Bahrain (3), demanding that all states understand and respect the concept of medical neutrality.

Medical professionalism has survived through its continuous engagement with society. Nevertheless, such societal contract is only meaningful when a mutual understanding exists between the government which defines and renders the licensing of the profession and the professionals in an organised society (4). The issue of dual loyalty is more magnified in situations of armed conflict, where medical personnel are threatened to abandon their professionalism.

Whilst there are numerous international Conventions and Declarations aimed at upholding medical ethics, they lack affirmative action for effectual and timely intervention. United Nations and the North Atlantic Treaty Organization could be more involved in taking a more proactive approach to intervene to ensure medical professionalism is upheld under any circumstances.

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Competing interests: No competing interests

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8.6 Appendix VI: (Professionalism in Pharmacy)

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LETTERS

Professionalism in Pharmacy: A Continual Societal and Intellectual Challenge

To the Editor. In early January 2012, a shocking news for the pharmacists and a sad report for the nation struck Malaysia. Two pharmacists were found involved in transferring psychotropic medications out of hospitals and smuggling them into the black market.[1] Subsequently, the ministry of health decided to table "The Pharmacy Bill 2012" in the parliament to empower the ministry to take stiffer penalties on pharmaceutical offenders.[2]

The question should be how such offences could happen rather than asking what should be the punishment for those who commit such transgressions. The approach should be a diagnostic attempt to find out the cause, motivation, and rationale behind such unprofessional and reprobate acts. Within this context, one may ask, if it stemmed from lack of educational effort on topics related to pharmacy ethics and professionalism especially in the developing countries?

The mission and vision of colleges and schools of pharmacy in Malaysia are well-defined. These schools emphasize professionalism and codes of conduct–albeit more emphasis is placed on the symbolic frame of professionalism[3] (ie, white coat ceremonies, dress codes, etc). These schools continuously assess the professionalism of their students, from the day of enrolment to the day of graduation.

Discussion of professionalism and pharmacy education has generated a substantial amount of literature over the years.[4,5] Schools and colleges of pharmacy in North America have been the pioneers and modernizers in the areas of professionalization in the practice of pharmacy as well as pharmacy education.[4,6] Professionalism in pharmacy is a multifaceted and dynamic process,[3] instigating a continuous development in defining and refining the traits of professionalism,[4] resulting in creation of peer-reviewed and referenced documents that are updated regularly.[7] These documents serve as guidelines to define, understand, and assess professionalism, by the academy in North America as well as in academic circles elsewhere. Hence, there is a globally cohesive and unified understanding of the overall concept of professionalism and professionalization.

Nevertheless, a lack of consensus on which skills or activities describe what is means to be a professional[3] and differences on how, when, and where professionalism should be taught, assessed, and monitored, have made professionalism and professionalization more challenging and argumentative topics.

We need to understand that the process of professionalization is not a discrete entity that is commenced at a specific time and ends at a time later. Professionalization is a continuum that never ends. The schools and colleges of pharmacy should not absolve themselves of responsibilities related to the professional performance of their students after they graduate. These schools and colleges should respect the need for an amendment to the current syllabi on professionalism that allows an "extension to the chain of professionalization-related responsibilities" which goes from beyond the academic environment (ie, classrooms, tutorial sessions) to the working environment (ie, community pharmacies, hospitals, clinics etc).

There is no doubt that new queries related to the performance of professional duties should be investigated in the context of law, moralities, and ethics,[8] the schools and colleges of pharmacy also need to respond to such queries with a full sense of responsibility and accountability.

Not only the ministry of health and parliament are responsible to deal with misdemeanour of this sort, but also the pharmacy boards and associations, schools and colleges of pharmacy should realize and accept the responsibility and accountability in managing such intricate situations.

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8.5 Appendix V: (Vignettes)

Following are the vignettes to be used as brief prompts during the focus group discussions. It is expected that an agreement on the domains and facets will be achieved which will eventually contribute to the development of the measurement tool.

Vignette 1:

"A patient is brought into the hospital A and E with severe pneumonia. The records reveal that the patient is HIV positive. The Medical Officer on duty is reluctant to attend the patient."

Vignette 2:

"As part of a routine examination Dr. A finds out that patient B is HIV positive. Despite patient B's insistence that B's spouse not be informed; Dr. A tells B's spouse of B's HIV status."

Vignette 3:

"Upon examining a HIV positive patient one of the medical officers makes a face and passes a comment while other medical officer watches and pretends that nothing has happened."

Vignette 4:

"Upon examining a HIV positive patient the infectious specialist makes a face and passes a comment while other medical officer watches and pretends that nothing has happened."

Vignette 5:

"Dr. A advises and encourages a HIV positive patient to use acupuncture, as an additional therapy to ART."

Vignette 6:

"Pharmacist A advises and encourages a HIV positive patient to use herbal supplement, as an additional therapy to ART."

Vignette 7:

"A HIV positive pregnant woman wants to terminate her pregnancy in the 2nd trimester of her pregnancy."

Vignette 8:

"A HIV positive patient is sent to the ward for blood withdrawal. The doctor in the ward refuses to withdraw the blood and has a nurse to do it. "

Vignette 9:

"Two patients with respiratory infection one HIV negative with pneumonia and the other one HIV positive with pneumonia and antibiotic to treat only one of them, which patient should get the treatment?"

Vignette 10:

"A nurse has contracted HIV while taking care of HIV/AIDS patients. Since then her service has been terminated."

Vignette 11:

"An applicant has been denied enrollment into medicine programme because of being HIV positive."

Vignette 12:

"Pharmacist A and pharmacist B decide not to let a customer known to be HIV positive try any of the cosmetic testers like lipsticks etc."

Vignette 13:

"Dr. A insists on compulsory internment of A HIV positive patient."

The vignettes have been designed to capture the interplay between a professional responsibility and a potentially stigmatized (HIV positive) or non-stigmatized (HIV negative) characteristic. Below-mentioned are some of the vignettes illustrating the interplay between trait(s) of professionalism and HIV positive or HIV negative subjects.

Responsibility for Standards of Medical Care to Patients

In an emergency, the practitioner should act without delay to preserve the continued health and life of a patient, keeping in mind the principle that the preservation of life is the paramount concern of the medical practitioner. The practitioner, towards this end, should ensure facilities and equipment in the place of practice adequate to provide such care.

Establishing Professional Relationship with Patients

A practitioner has a responsibility to provide care to a patient whether in an emergency or otherwise. It is unethical to deny treatment to a patient with an infectious disease, and the practitioner is expected to take normal precautions to prevent contacting or spreading diseases.

Vignette:

"A patient is brought into the hospital A and E with severe pneumonia. The records reveal that the patient is HIV positive. The Medical Officer on duty is reluctant to attend the patient."

Confidentiality and Abuse of confidence

Patients have the right to expect that there will not be disclosure of any personal information, which is learnt during the course of a practitioner's professional duties. A practitioner may release confidential information in strict accordance with the patient's consent, or the consent of a person properly authorized to act on the patient's behalf. When such permission

is granted the practitioner should only disclose such relevant confidential information for a specific purpose.

The practitioner must respect requests by patients that information should not be disclosed to third parties, except in exceptional circumstances (for example, where the health or safety of others would otherwise be at serious risk)

Doctor–patient partnership

Protecting patients' privacy and right to confidentiality, unless release of information is required by law or by public-interest considerations.

Confidentiality and privacy

Patients have a right to expect that doctors and their staff will hold information about them in confidence, unless release of information is required by law or public interest considerations.

Vignette:

"As part of a routine examination Dr. A finds out that patient B is HIV positive. Despite patient B's insistence that B's spouse not be informed; Dr. A tells B's spouse of B's HIV status."

The Practitioner and Requests for Consultation

The medical practitioner's communication with patients in the course of management refers to verbal and non-verbal communication, including gestures, facial expression, voice intonation, etc. It also includes modes of communication, through the telephone, e-mail or short message service (sms) messaging. The importance of communication in a friendly and convivial but not patronizing atmosphere cannot be over-emphasized.

The doctor as a team player

A doctor may have good reason or grounds to believe that a colleague is practicing unethically or immorally, or is mentally or physically incapable of handling or treating patients. It is then his duty to bring the matter up to the attention of the Malaysia Medical Council, in the interests of the public.

Vignette:

"Upon examining a HIV positive patient one of the medical officers makes a face and passes a comment while other medical officer watches and pretends that nothing has happened."

Or

Vignette:

"Upon examining a HIV positive patient the infectious specialist makes a face and passes a comment while other medical officer watches and pretends that nothing has happened."

The Practitioner and the Practice of Unconventional (Traditional/Complementary) Medicine

A medical practitioner should not practice traditional or complementary medicine or prescribe health supplements or traditional medications. However, such medication approved and based on clinical evidence, and accepted into mainstream medical practice, may be considered favorably.

Vignette:

"Dr. "A" advises and encourages a HIV positive patient to use acupuncture, as an additional therapy to ART. "

Vignette:

"Pharmacist A advises and encourages a HIV positive patient to use herbal supplement, as an additional therapy to ART."

Ending a professional relationship*

In some circumstances, the relationship between a doctor and patient may become ineffective or compromised, and you may need to end it. Good medical practice involves ensuring that the patient is adequately informed of your decision and facilitating arrangements for the continuing care of the patient, including passing on relevant clinical information.

Vignette

"When my doctor found out that I had lied about my HIV status to my wife and had not informed her that I was HIV positive, despite of my earlier promise to my doctor, he decided to stop helping me in getting treatment for my HIV condition because of I had lied and asked me to look for another doctor."

Induced Termination of Pregnancy

Induced non-therapeutic termination of pregnancy, is serious professional misconduct, and is also an offence under the Penal Code.

Vignette:

"A HIV positive pregnant woman wants to terminate her pregnancy in the 2nd trimester of her pregnancy."

Universal Precautions

Patients, who have been discovered during preliminary investigations to have serious communicable diseases, like AIDS or hepatitis, should nonetheless be treated by doctors, practicing accepted universal precautions. To refuse to care for such patients or to refer them away is considered unethical.

Pregnant health-care workers are not known to be at greater risk of contracting HIV infection than health-care workers who are not pregnant.

Doctor's own health

Good medical practice involves:

- Recognizing the impact of fatigue on your health and your ability to care for patients, and endeavoring to work safe hours wherever possible.
- If you know or suspect that you have a health condition or impairment that could adversely affect your judgment, performance or your patient's health:
- Not relying on your own assessment of the risk you pose to patients

Vignette:

"A HIV positive patient is sent to the ward for blood withdrawal. The doctor in the ward refuses to withdraw the blood and has a nurse to do it. "

Decisions about access to medical care

Your decisions about patients' access to medical care need to be free from bias and discrimination. Good medical practice involves:

Not prejudicing your patient's care because you believe that a patient's behavior has contributed to their condition.

Being aware of your right to not provide or directly participate in treatments to which you conscientiously object, informing your patients and, if relevant, colleagues, of your objection, and not using your objection to impede access to treatments that are legal.

Not allowing your moral or religious views to deny patients access to medical care, recognizing that you are free to decline to personally provide or participate in that care.

Wise use of healthcare resources

It is important to use healthcare resources wisely. Good medical practice involves:

Supporting the transparent and equitable allocation of healthcare resources.

Vignette:

"Two patients with respiratory infection one HIV negative with pneumonia and the other one HIV positive with pneumonia and antibiotic to treat only one of them, which patient should get the treatment?"

Lack of support systems for healthcare workers

Vignette:

"A nurse has contracted HIV while taking care of HIV/AIDS patients. Since then her service has been terminated."

Relationship with Pharmacists and members of the allied profession

Keeping confidentiality in mind, pharmacists consult with colleagues or other healthcare professionals to benefit the patient. If appropriate, pharmacists refer their patients to other healthcare professionals or agencies.

Vignette:

"Pharmacist A and pharmacist B decide not to let a customer known to be HIV positive try any of the cosmetic testers like lipsticks etc."

8.7 Appendix VII: (Study protocol)

Purpose of the Study:

The aim of this research is to develop an instrument for measuring stigmatizing attitude towards HIV/AIDS in a professional and in a private context

Methods:

Study Design:

A serial-cross sectional design (between cohorts in different years i.e., 1st year to final year) will be combined with a two-point in time longitudinal cohort design (between the beginning and the end of a single year of study) if time permits. This quantitative study will be conducted among the undergraduate pharmacy and undergraduate/graduate medical students of Monash University in Malaysia and Australia, and Universiti Sains Malaysia (USM) in Malaysia. A questionnaire will be used to collect the data. The questionnaire will be administered at the beginning and at the end of a single year of study.

Sampling of Participants:

The sampling pool will consist of undergraduate pharmacy and undergraduate and graduate medical students of Monash University in Malaysia and Australia; Universiti Sains Malaysia (USM).

Recruitment Process:

The study protocol and explanatory statement will be passed on to the heads of schools pharmacy and medicine in Malaysian and Australian campuses of Monash

University; Universiti Sains Malaysia (USM) to indicate and grant the permission to recruit the students.

Upon approval of the heads of the schools, the students will be approached. The study protocol, explanatory statement and questionnaire will be given to the students. Once the study protocol, explanatory statements are read by the participants then the participants are asked to fill in the questionnaires. The questionnaires are collected at the end of session.

In Australia the email containing the study protocol, explanatory statement and the questionnaire shall be sent to the head of the school of medicine or an appointee appointed by the head of the school. Once approval to conduct the study is obtained the survey link will be uploaded on "Blackboard" site for students to answer the survey. Three reminders will be sent to the students who yet to fill up the questionnaire.

Inclusion Criteria:

- Undergraduate pharmacy students at Monash University Malaysian campus and USM aged 17 and above.
- Undergraduate pharmacy students at Monash University Australian campus aged 17 and above.
- Undergraduate/graduate medical students at Monash University Malaysian campuses and USM aged 17 and above.
- Undergraduate and graduate medical students at Monash University Australian campuses aged 17 and above.

Data Collection:

The questionnaires will be used to collect the data. In Malaysia for pharmacy and medical students and in Australia for pharmacy students paper-based survey will be the method of data collection, where the participants will fill up the questionnaire manually.

For medical students in Australia the web-based survey will be the method of data collection, where the participants will full up the questionnaire online.

Data Analysis:

"R" software will be used to analyze the data.

8.8 Appendix VIII: (Explanatory statement)

Title: Measuring HIV/AIDS-related stigma: the professional and the private view

This information sheet is for you to keep. You are invited to take part in this study. Please read this Explanatory Statement in full before making a decision.

My name is Keivan Ahmadi and I am conducting a research project with Professor Dr. Daniel Reidpath a professor of Global Public Health, Professor Dr. Pascale Allotey a professor of Global Public health in the Department of Medicine and Health Sciences, Monash University and Dr. Mohamed Azmi Ahmad Hassali an associate professor in the School of Pharmaceutical Sciences, Universiti Sains Malaysia (USM) towards a PhD-Med at Monash University. The research will contribute to my doctoral thesis.

Why did you choose this particular person/group as participants?

I am interested in studying the relationship between stigmatizing attitude towards HIV/AIDS and professional development among future healthcare professionals. Being the future members of the healthcare team, I have chosen the undergraduate and graduate medical and undergraduate pharmacy students of Universiti Sains Malaysia (USM); and Monash University in Australia and Malaysia

The aim/purpose of the research

The aim of this research is to develop an instrument for measuring stigmatizing attitude towards HIV/AIDS in a professional and in a private context.

Possible benefits

There will be no direct benefits for participants in this study; however, the findings of this study will help in developing a validated and reliable measurement tool (i.e., questionnaire) which is able to distinguish the measures of HIV/AIDS-related stigma between professional domain and private domain.

Moreover, the findings of this research can be crucial in helping us to gain a better understanding of the relationship between professionalization and negative social attitudes towards HIV/AIDS at cohort level as well as individual level. In brief, this research has the potential to improve our understanding of both professionalization as an educational process and of disease related stigma.

What does the research involve?

The study involves filling in the questionnaire twice. The first round of questionnaire administration will be at the beginning of the academic year and the second round will be near the end of the academic year. The questionnaire is program specific i.e., the one for the medical undergraduate students is different from the one for the pharmacy undergraduate students.

The pharmacy students in Australia and Malaysia and the medical students in Malaysia will be given a self-administered questionnaire, whereas, the medical students in Australia will fill in the online questionnaire.

How much time will the research take?

Filling in the questionnaire would take approximately 12 minutes.

Inconvenience/discomfort

There should not be any inconvenience or discomfort from participating in this research. All information gathered will be kept anonymous and non-identifiable.

Payment

The participants will not be paid for filling in the questionnaire.

Can I withdraw from the research?

Being in this study is voluntary and you are under no obligation to consent to participation. As the data collection will be carried out twice you are encouraged to participate in both rounds of data collection. Please be noted that once you have submitted your questionnaire, you can withdraw from the study but your data cannot be withdrawn from the study because your submitted questionnaire will not be identifiable.

Confidentiality

All necessary measures will be taken to protect your privacy. Any data that the researcher extracts from the questionnaire for use in reports or published findings will not, under any circumstances, contain your name or identifying characteristics.

Storage of data

Data collected will be stored in accordance with Monash University regulations, kept on University premises, in a locked filing cabinet for 5 years. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

Use of data for other purposes

The data will only be used in the analysis of professional attitudes toward the management of people with HIV/AIDS.

Results

If you would like to be informed about the research finding, please contact Keivan Ahmadi on his mobile: +6012 478 4170 or office number: +603 5514 6300 Extn 61569 or email at: kahm4@student.monash.edu. Summary information about the findings will be available from 1st April 2013.

If you would like to contact the researchers about any aspect of this study, please contact the Chief Investigator:	If you have a complaint concerning the manner in which this research <CF12/0829-2012000368> is being conducted, please contact:
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Thank you.

Keivan Ahmadi

8.9 Appendix IX: (Questionnaire for medical students)

The questionnaire's demographic section was contextualized to the context of race categories and name of the campuses of Monash University in Australia and Malaysia. The first page 1 (See page 263) was used to collect the demographics of Monash medical students in Australia. The second page 1 (See page 264) was used to collect the demographics in Malaysia.

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Health Care Knowledge and Attitude Questionnaire

Dear Student:

The information obtained in this study will be used as a partial fulfillment of a PhD project and hopefully to be used as practical guidelines for provision of better care. Many of the questions relate to people who are HIV positive- that is, people who are infected with the Human Immunodeficiency Virus (HIV) which if left untreated leads to the development of Acquired Immune Deficiency Syndrome (AIDS) and death.

Please answer ALL questions honestly.

About You

1. .What is your gender?

Female……. ☐
Male……. ☐

2. . How old are you?

☐ years old.

3. What is your nationality?

Australian…… ☐
Other, please specify →

4. Are you an international student?

YES…… ☐
NO…… ☐

5. In which year of your course are you enrolled?

First year…… ☐
Second year…… ☐
Third year…… ☐
Fourth year…… ☐
Fifth year…… ☐

6. What is your primary ethnicity?

White or White Australian…… ☐
Indigenous…… ☐
Black or Black Australian of African descent…… ☐
Asian or Asian Australian of Indian descent…… ☐
Asian or Asian Australian of Chinese descent…… ☐
Other Asian or Asian Australian, Please specify →

Other, please specify →

7. In which campus are you enrolled?

Parkville…… ☐
Sunway…… ☐
Clayton…… ☐
Gippsland…… ☐
Other, please specify →

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Health Care Knowledge and Attitude Questionnaire

Dear Student:

The information obtained in this study will be used as a partial fulfillment of a PhD project and hopefully to be used as practical guidelines for provision of better care. Many of the questions relate to people who are HIV positive- that is, people who are infected with the Human Immunodeficiency Virus (HIV) which if left untreated leads to the development of Acquired Immune Deficiency Syndrome (AIDS) and death.

Please answer ALL questions honestly.

About You

1. .What is your gender?

Female..... ☐
Male..... ☐

2. . How old are you?

☐ years old.

3. What is your nationality?

Malaysian..... ☐
Other, please specify →

4. Are you an international student?

YES..... ☐
NO..... ☐

5. What is your primary ethnicity?

Malay..... ☐
Chinese..... ☐
Indian..... ☐
Other Bumiputra, please specify →
Other, please specify →

6. In which campus are you enrolled?

Parkville..... ☐
Sunway..... ☐
Clayton..... ☐
Gippsland..... ☐
Other, please specify →

7. In which year of your course are you enrolled?

First year..... ☐
Second year..... ☐
Third year..... ☐
Fourth year..... ☐
Fifth year..... ☐

Please tick *only* ONE box on each line

	YES	NO	Don't know
1. Is there a difference between HIV and AIDS?	☐ 1	☐ 2	☐ 3
2. Can someone prevent getting HIV by abstaining from sex?	☐ 1	☐ 2	☐ 3
3. Can someone prevent getting HIV by remaining faithful to a faithful partner?*	☐ 1	☐ 2	☐ 3
4. Can someone prevent getting HIV by always using condoms correctly?	☐ 1	☐ 2	☐ 3
5. Can HIV be transmitted from a mother to her baby during pregnancy?*	☐ 1	☐ 2	☐ 3
6. Is there a cure for AIDS?	☐ 1	☐ 2	☐ 3
7. Do you know of treatment that can prolong the life of people living with HIV/AIDS?	☐ 1	☐ 2	
8. In a married couple, is it possible for one person to be HIV positive and the other one be HIV negative?*	☐ 1	☐ 2	☐ 3
9. Can HIV be transmitted from a mother to her baby during delivery?*	☐ 1	☐ 2	☐ 3
10. Can someone get HIV by sharing food with a person who is HIV positive?	☐ 1	☐ 2	☐ 3
11. Is it possible for a healthy-looking person to be HIV positive?	☐ 1	☐ 2	☐ 3
12. Can HIV be transmitted from a mother to her baby by breastfeeding?*	☐ 1	☐ 2	☐ 3
13. Can someone get HIV from mosquito bites?	☐ 1	☐ 2	☐ 3

On a 7 point scale please tick one box for each statement below to show how much you agree or disagree with it.

Please tick *only* ONE box on each line

	Agree strongly			Neither agree nor disagree			Disagree strongly
14. If an HIV/AIDS patient attends a busy Accident & Emergency, a Doctor should be able to choose to treat another patient instead.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
15. A doctor could refuse to treat a patient with HIV/AIDS to protect him/herself from contracting HIV/AIDS.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
16. A doctor should wear gloves to measure height and weight of an HIV/AIDS patient.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
17. Governments should provide free health care to people with Type 2 diabetes.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
18. An HIV positive patient is admitted on to a general medical ward. A colleague suggests that the patient's bed should be marked in a way that the HIV status was easily recognisable by staff (but not by other patients).	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
19. A colleague working as a pharmacist in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive pharmacist should have her/his position terminated.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
20. In general it would be better if HIV positive patients were treated in facilities separate from other patients.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
21. A surgeon could refuse to operate on a patient with HIV/AIDS to protect him/herself from contracting HIV/AIDS.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
22. A hospital has implemented a policy of mandatory testing for hepatitis C at recruitment of its health care workers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
23. A colleague working as a doctor in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive Doctor should have her/his position terminated.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Please tick *only* ONE box on each line

	Agree strongly			Neither agree nor disagree			Disagree strongly
24. A doctor suggests acupuncture as an additional therapy to an HIV/AIDS patient.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
25. A pregnant nurse refuses to give an injection to an HIV/AIDS patient and asks her colleague instead to give the injection.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
26. Surgeons with HIV should be allowed to continue working.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
27. People with HIV should be barred from participating in contact sports like football.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
28. People with HIV/AIDS should be obliged to reveal their health condition to their doctor.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
29. A hospital has implemented a policy of mandatory testing for HIV at recruitment of its health care workers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
30. A colleague working as a nurse in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive nurse should have her/his position terminated.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
31. A doctor suggests acupuncture as an additional therapy to a patient with a series of colds in the past 3 months.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
32. People with HIV/AIDS should be isolated.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
33. People with HIV should **NOT** be allowed to work in kindergartens.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
34. People with HIV should **NOT** adopt children.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Please tick *only* ONE box on each line

	Agree strongly			Neither agree nor disagree			Disagree strongly
35. People with HIV should **NOT** be teachers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
36. People with HIV should **NOT** be religious leaders.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
37. People with HIV should **NOT** be police officers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
38. People with HIV should **NOT** be bus drivers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
39. People with HIV should **NOT** be barbers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
40. Physicians with HIV should be allowed to continue working.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
41. People with HIV should be allowed to travel between the countries.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
42. People with HIV/AIDS have the right **NOT** to reveal their status to their friends.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
43. People with HIV/AIDS have the right **NOT** to reveal their status to their family.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
44. Pharmacists with HIV should be allowed to continue working.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
45. People with HIV/AIDS should be penalised if they have sexual relations without revealing their health status.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Please tick *only* ONE box on each line

	Agree strongly			Neither agree nor disagree			Disagree strongly
46. A family has a right to know if a member is infected with HIV and this is more important than a family member's right to privacy.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
47. A hospital has implemented a policy of mandatory testing for HIV at recruitment of its cleaning staff.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
48. Children with HIV in schools should be kept together in the same classroom.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
49. Governments should provide free health care to people with HIV/AIDS.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
50. In general it would be better if patients with hepatitis were treated in facilities separate from other patients.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
51. A hospital has implemented a policy of mandatory testing for hepatitis C at recruitment of its cleaning staff.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

On a 7 point scale please tick one box for each statement below which accurately reflects your level of certainty.

Please tick *only* ONE box on each line

	Definitely NO			Undecided			Definitely YES
52. While working in a ward you hear a colleague (doctor) passing a demeaning comment about an HIV/AIDS patient without being heard by the patient. Do you think there is any harm in this?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
53. Would you discourage your sibling from becoming friends with your close friend who has recently become HIV positive?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
54. While working in a ward you hear a colleague (doctor) passing a demeaning comment about an HIV/AIDS patient without being heard by the patient. Would you criticise your colleague?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
55. If you come to know that your friend is HIV positive, would you continue your friendship with him/her?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
56. Would you allow your HIV positive friend to use your bathroom?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
57. An asthmatic patient, who is in the 2nd trimester of her pregnancy with no clinical complications, asks for referral so she can obtain an abortion. Would you refer her for an abortion?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
58. If you come to know that your colleague is HIV positive, would you continue working with him/her?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
59. An HIV positive patient, who is in the 2nd trimester of her pregnancy with no clinical complications, asks for referral so she can obtain an abortion. Would you refer her for an abortion?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
60. An HIV+ patient is in hospital for treatment of a minor back injury. The patient's heart suddenly stops beating (cardiac arrest). Would you immediately start to resuscitate?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Please tick *only* ONE box on each line

	Definitely NO			Undecided			Definitely YES
61. While working in a ward you hear a colleague (doctor) passing a demeaning comment about an HIV/AIDS patient without being heard by the patient. Would you report your colleague to his/her supervisor?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
62. Would you send your child to a school where one of its teachers is HIV positive?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
63. Would you discourage your sibling from becoming friends with an HIV/AIDS person?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
64. The pathology laboratory returns test results showing that a patient is HIV positive, and the patient's spouse is HIV negative. Should the attending doctor inform the spouse?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
65. A patient is in hospital for treatment of a minor back injury. The patient's heart suddenly stops beating (cardiac arrest). Would you immediately start to resuscitate?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Please tick *only* ONE box on each line

66. You have two patients in need of a liver transplant. They are identical in every way, except that one patient is HIV positive and the other is not. A suitable donor liver is available for transplant. Who should receive the liver?	**Definitely the non-HIV patient**	☐ 1	☐ 2	☐ 3	**No preference** ☐ 4	☐ 5	☐ 6	☐ 7 **Definitely the HIV patient**
67. Two patients arrive at the Accident & Emergency Department at the same time. Both patients have severe lung infection. They are identical in every way, except that one patient is HIV positive and the other is not. You only have enough antibiotics to treat a single patient. Who should receive the treatment?	**Definitely the non-HIV patient**	☐ 1	☐ 2	☐ 3	**No preference** ☐ 4	☐ 5	☐ 6	☐ 7 **Definitely the HIV patient**
68. You are given the choice of two possible individuals as your roommate. One is a basketball player and the other one is HIV positive. Which one would you be most likely to choose?	**Definitely the basketball player**	☐ 1	☐ 2	☐ 3	**No preference** ☐ 4	☐ 5	☐ 6	☐ 7 **Definitely the HIV positive individual**

Thank you for completing this survey. There is a chance that I will repeat this survey in the future. It would be very helpful if you could provide your student ID so I could tally responses given now with responses you may give later.
You will remain **anonymous** and the ID will only be used to link the answers.
If you wish to provide your student ID please fill in the space provided, otherwise you can opt not to provide your student ID.

Your Student ID ☐

8.10 Appendix X: (Questionnaire for pharmacy students)

The questionnaire's demographic section was contextualized to the context of race categories and name of the campuses of Monash University in Australia and Malaysia. The first page 1 (See page 274) was used to collect the demographics of Monash medical students in Australia. The second page 1 (See page 275) was used to collect the demographics in Malaysia.

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Health Care Knowledge and Attitude Questionnaire

Dear Student:

The information obtained in this study will be used as a partial fulfillment of a PhD project and hopefully to be used as practical guidelines for provision of better care. Many of the questions relate to people who are HIV positive- that is, people who are infected with the Human Immunodeficiency Virus (HIV) which if left untreated leads to the development of Acquired Immune Deficiency Syndrome (AIDS) and death.

Please answer ALL questions honestly.

About You

1. .What is your gender?

Female……. ☐
Male……. ☐

2. . How old are you?

☐ years old.

3. What is your nationality?

Australian…… ☐
Other, please specify →

4. Are you an international student?

YES……. ☐
NO……. ☐

5. In which year of your course are you enrolled?

First year……. ☐
Second year…… ☐
Third year……. ☐
Fourth year…..... ☐

6. What is your primary ethnicity?

White or White Australian……. ☐
Indigenous……. ☐
Black or Black Australian of African descent……. ☐
Asian or Asian Australian of Indian descent……. ☐
Asian or Asian Australian of Chinese descent……. ☐
Other Asian or Asian Australian, Please specify →

Other, please specify →

7. In which campus are you enrolled?

Parkville…… ☐
Sunway…… ☐
Clayton…… ☐
Gippsland…… ☐
Other, please specify →

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Health Care Knowledge and Attitude Questionnaire

Dear Student:

The information obtained in this study will be used as a partial fulfillment of a PhD project and hopefully to be used as practical guidelines for provision of better care. Many of the questions relate to people who are HIV positive- that is, people who are infected with the Human Immunodeficiency Virus (HIV) which if left untreated leads to the development of Acquired Immune Deficiency Syndrome (AIDS) and death.

Please answer ALL questions honestly.

About You

1. .What is your gender?

Female……☐
Male……☐

2. . How old are you?

☐ years old.

3. What is your nationality?

Malaysian……☐
Other, please specify →

4. Are you an international student?

YES……☐
NO……☐

5. What is your primary ethnicity?

Malay……☐
Chinese……☐
Indian……☐
Other Bumiputra, please specify →
Other, please specify →

6. In which campus are you enrolled?

Parkville……☐
Sunway……☐
Clayton……☐
Gippsland……☐
Other, please specify →

7. In which year of your course are you enrolled?

First year……☐
Second year……☐
Third year……☐
Fourth year……☐

Please tick *only* ONE box on each line

	YES	NO	Don't know
1. Is there a difference between HIV and AIDS?	☐ 1	☐ 2	☐ 3
2. Can someone prevent getting HIV by abstaining from sex?	☐ 1	☐ 2	☐ 3
3. Can someone prevent getting HIV by remaining faithful to a faithful partner?*	☐ 1	☐ 2	☐ 3
4. Can someone prevent getting HIV by always using condoms correctly?	☐ 1	☐ 2	☐ 3
5. Can HIV be transmitted from a mother to her baby during pregnancy?*	☐ 1	☐ 2	☐ 3
6. Is there a cure for AIDS?	☐ 1	☐ 2	☐ 3
7. Do you know of treatment that can prolong the life of people living with HIV/AIDS?	☐ 1	☐ 2	
8. In a married couple, is it possible for one person to be HIV positive and the other one be HIV negative?*	☐ 1	☐ 2	☐ 3
9. Can HIV be transmitted from a mother to her baby during delivery?*	☐ 1	☐ 2	☐ 3
10. Can someone get HIV by sharing food with a person who is HIV positive?	☐ 1	☐ 2	☐ 3
11. Is it possible for a healthy-looking person to be HIV positive?	☐ 1	☐ 2	☐ 3
12. Can HIV be transmitted from a mother to her baby by breastfeeding?*	☐ 1	☐ 2	☐ 3
13. Can someone get HIV from mosquito bites?	☐ 1	☐ 2	☐ 3

On a 7 point scale please tick one box for each statement below to show how much you agree or disagree with it.

Please tick *only* ONE box on each line

	Agree strongly			Neither agree nor disagree			Disagree strongly
14. If an HIV/AIDS patient attends a busy Accident & Emergency, a Doctor should be able to choose to treat another patient instead.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
15. A doctor could refuse to treat a patient with HIV/AIDS to protect him/herself from contracting HIV/AIDS.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
16. A doctor should wear gloves to measure height and weight of an HIV/AIDS patient.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
17. Governments should provide free health care to people with Type 2 diabetes.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
18. An HIV positive patient is admitted on to a general medical ward. A colleague suggests that the patient's bed should be marked in a way that the HIV status was easily recognisable by staff (but not by other patients).	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
19. A colleague working as a pharmacist in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive pharmacist should have her/his position terminated.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
20. In general it would be better if HIV positive patients were treated in facilities separate from other patients.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
21. A surgeon could refuse to operate on a patient with HIV/AIDS to protect him/herself from contracting HIV/AIDS.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
22. A hospital has implemented a policy of mandatory testing for hepatitis C at recruitment of its health care workers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
23. A colleague working as a doctor in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive Doctor should have her/his position terminated.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Please tick *only* ONE box on each line

	Agree strongly			Neither agree nor disagree			Disagree strongly
24. A pharmacist suggests acupuncture as an additional therapy to an HIV/AIDS patient.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
25. A pregnant nurse refuses to give an injection to an HIV/AIDS patient and asks her colleague instead to give the injection.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
26. Surgeons with HIV should be allowed to continue working.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
27. People with HIV should be barred from participating in contact sports like football.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
28. People with HIV/AIDS should be obliged to reveal their health condition to their doctor.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
29. A hospital has implemented a policy of mandatory testing for HIV at recruitment of its health care workers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
30. A colleague working as a nurse in the same hospital as you tells you that s/he has just tested positive for HIV. Another colleague suggests that the HIV positive nurse should have her/his position terminated.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
31. A pharmacist suggests acupuncture as an additional therapy to a patient with a series of colds in the past 3 months.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
32. People with HIV/AIDS should be isolated.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
33. People with HIV should **NOT** be allowed to work in kindergartens.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
34. People with HIV should **NOT** adopt children.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Please tick *only* ONE box on each line

	Agree strongly			Neither agree nor disagree			Disagree strongly
35. People with HIV should **NOT** be teachers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
36. People with HIV should **NOT** be religious leaders.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
37. People with HIV should **NOT** be police officers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
38. People with HIV should **NOT** be bus drivers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
39. People with HIV should **NOT** be barbers.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
40. Physicians with HIV should be allowed to continue working.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
41. People with HIV should be allowed to travel between the countries.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
42. People with HIV/AIDS have the right **NOT** to reveal their status to their friends.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
43. People with HIV/AIDS have the right **NOT** to reveal their status to their family.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
44. Pharmacists with HIV should be allowed to continue working.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
45. People with HIV/AIDS should be penalised if they have sexual relations without revealing their health status.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Please tick *only* ONE box on each line

	Agree strongly				Neither agree nor disagree		Disagree strongly
46. A family has a right to know if a member is infected with HIV and this is more important than a family member's right to privacy.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
47. A hospital has implemented a policy of mandatory testing for HIV at recruitment of its cleaning staff.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
48. Children with HIV in schools should be kept together in the same classroom.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
49. Governments should provide free care to people with HIV/AIDS.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
50. In general it would be better if patients with hepatitis were treated in facilities separate from other patients.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
51. A hospital has implemented a policy of mandatory testing for hepatitis C at recruitment of its cleaning staff.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

On a 7 point scale please tick one box for each statement below which accurately reflects your level of certainty.

Please tick *only* ONE box on each line

	Definitely NO			Undecided			Definitely YES
52. While working in a ward you hear a colleague (pharmacist) passing a demeaning comment about an HIV/AIDS patient without being heard by the patient. Do you think there is any harm in this?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
53. Would you discourage your sibling from becoming friends with your close friend who has recently become HIV positive?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
54. While working in a ward you hear a colleague (pharmacist) passing a demeaning comment about an HIV/AIDS patient without being heard by the patient. Would you criticise your colleague?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
55. If you come to know that your friend is HIV positive, would you continue your friendship with him/her?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
56. Would you allow your HIV positive friend to use your bathroom?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
57. An asthmatic patient, who is in the 2nd trimester of her pregnancy with no clinical complications, asks for referral so she can obtain an abortion. Would you refer her for an abortion?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
58. If you come to know that your colleague is HIV positive, would you continue working with him/her?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
59. An HIV positive patient, who is in the 2nd trimester of her pregnancy with no clinical complications, asks for referral so she can obtain an abortion. Would you refer her for an abortion?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
60. While working in a ward you hear a colleague (pharmacist) passing a demeaning comment about an HIV/AIDS patient without being heard by the patient. Would you report your colleague to his/her supervisor?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
61. Would you send your child to a school where one of its teachers is HIV positive?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
62. Would you discourage your sibling from becoming friends with an HIV/AIDS person?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
63. The pathology laboratory returns test results showing that a patient is HIV positive, and the patient's spouse is HIV negative. Should the attending doctor inform the spouse?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Please tick *only* ONE box on each line

64. You have two patients in need of medication prior to a liver transplant. They are identical in every way, except that one patient is HIV positive and the other is not. There is medication for a single patient. Who should receive the medication?	**Definitely the non-HIV patient**			**No preference**			**Definitely the HIV patient**
	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
65. You are working at a pharmacy in a hospital. You receive two prescriptions at the same time. Both prescriptions contain an antibiotic to treat severe lung infection. Both patients are identical in every way, except that one patient is HIV positive and the other is not. You only have enough antibiotic to be dispensed to treat a single patient. Who should receive the treatment?	**Definitely the non-HIV patient**			**No preference**			**Definitely the HIV patient**
	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
66. You are given the choice of two possible individuals as your roommate. One is a basketball player and the other one is HIV positive. Which one would you be most likely to choose?	**Definitely the basketball player**			**No preference**			**Definitely the HIV positive individual**
	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Thank you for completing this survey. There is a chance that I will repeat this survey in the future. It would be very helpful if you could provide your student ID so I could tally responses given now with responses you may give later.
You will remain **anonymous** and the ID will only be used to link the answers.
If you wish to provide your student ID please fill in the space provided, otherwise you can opt not to provide your student ID.

Your Student ID ☐

8.11 Appendix XI: (Selected HIV/AIDS stigma measures)

Assessing Willingness to Care for Persons with AIDS: Validation of a New Measure

Willingness to Care Scale (WCS) is a multifactorial measure assessing the experiences of informal caregivers for persons living with AIDS (PLAs).Willingness to care describes one's attitude toward providing emotional, instrumental, and nursing support. Interviews were conducted with **155 caregivers of PLAs** on caregiving and psychosocial concerns.

AIDS caregiving can be a demanding and sometimes overwhelming experience. Caregivers may differ in the tasks they feel able and/or willing to perform.

Being ***able*** to perform a task means that you believe you ***could do*** *it* if necessary.

Being ***willing*** to perform a task means that you feel you ***would do*** *it* if it had to be done.

As you read the statements below, think about the person with AIDS you know who is in need of care. FIRST, place an "X" by each one of the tasks *you feel able* to do for him or her. SECOND, reread the items, and CIRCLE THE NUMBER which best shows *how willing you are* to do each one, where:

1 = completely unwilling 2 = somewhat unwilling 3 = not sure 4 = somewhat willing 5 = completely willing

	ABLE?	***How willing?***
1. Listen to someone who is sad.		1 2 3 4 5
2. Comfort someone who is upset.		1 2 3 4 5
3. Help someone deal with anxiety about the future.		1 2 3 4 5

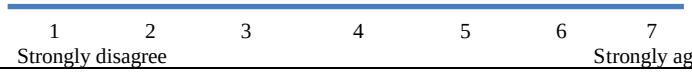
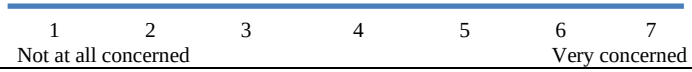
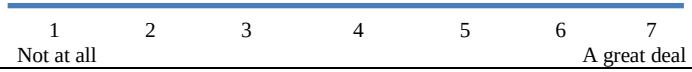
4. Hold hands with someone who is afraid.		1	2	3	4	5
5. Encourage someone who feels hopeless.		1	2	3	4	5
6. Listen to someone's concerns about death or dying.		1	2	3	4	5
7. Help someone keep their spirits up.		1	2	3	4	5
8. Hold someone who is crying.		1	2	3	4	5
9. Listen to someone who is angry.		1	2	3	4	5
10. Be patient with someone who is disoriented or confused.		1	2	3	4	5
11. Take someone to a medical appointment.		1	2	3	4	5
12. Bring home groceries for someone.		1	2	3	4	5
13. Help pay for someone's medicine.		1	2	3	4	5
14. Prepare meals for someone.		1	2	3	4	5
15. Clean someone's room or home.		1	2	3	4	5
16. Wash someone's dishes.		1	2	3	4	5
17. Do someone's laundry.		1	2	3	4	5
18. Help pay for someone's food or housing.		1	2	3	4	5

19. Have someone live in your home.		1	2	3	4	5
20. Negotiate someone's healthcare options with a doctor.		1	2	3	4	5
21. Help someone take medicine.		1	2	3	4	5
22. Change dirty bed sheets.		1	2	3	4	5
23. Help someone take a bath.		1	2	3	4	5
24. Clean up after someone who has lost bowel or bladder control.		1	2	3	4	5
25. Help someone eat a meal.		1	2	3	4	5
26. Clean up when someone has thrown up.		1	2	3	4	5
27. Turn someone in bed.		1	2	3	4	5
28. Change dressings on someone's sores.		1	2	3	4	5
29. Help someone in the bathroom.		1	2	3	4	5
30. Help someone move in and out of bed.		1	2	3	4	5

Examining HIV/AIDS provider stigma: assessing regional concerns in the islands of the Eastern Caribbean.

Respondents included **39 persons in Barbados** (primarily sports coaches), and **35 persons in Grenada** and **16 in Trinidad and Tobago** (primarily health and social services providers) (see Table I). Most were women, and average age was 39.2 years. Over half were service providers; of those, 59% were likely to have direct physical contact with PLHA. Most worked with more than one age group.

Attitude towards PLHA	
-PLHA don't care if they infect others.	1 2 3 4 5 6 7 Strongly disagree Strongly agree
-PLHA are responsible for having their illness.	1 2 3 4 5 6 7 Strongly disagree Strongly agree
-PLHA who got HIV through sex or drug use got what they deserve.	1 2 3 4 5 6 7 Strongly disagree Strongly agree
Transmission Beliefs	
-Sharing a glass with a PLHA	1 2 3 4 5 6 7 Very unlikely Very likely
-Using public toilets	1 2 3 4 5 6 7 Very unlikely Very likely
-Being coughed or sneezed on	1 2 3 4 5 6 7 Very unlikely Very likely
Trust of Authorities and Experts	
-Scientists and doctors can be trusted to tell the truth about HIV/AIDS	1 2 3 4 5 6 7 Strongly disagree Strongly agree

-Expert opinions about casual contact is true	
HIV testing and concerns about stigma	
-Testing HIV+ may lead to discrimination.	
-Concerns about discrimination might affect decision to be tested	

Accurate and inaccurate HIV transmission beliefs, stigmatizing and HIV protection motivation in northern Thailand

In Chiang Rai, northern **Thailand**, **219 respondents** filled in a structured questionnaire assessing:

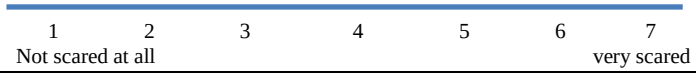
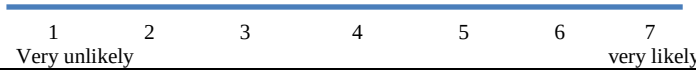
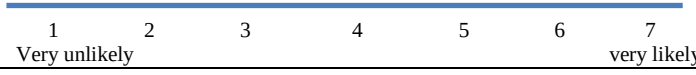
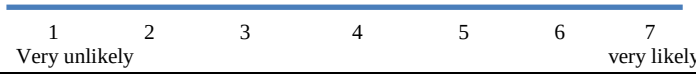
- accurate and inaccurate HIV transmission beliefs,
- emotional reactions towards PWA and AIDS risk groups,
- stigmatizing attitudes and
- motivation to protect from HIV

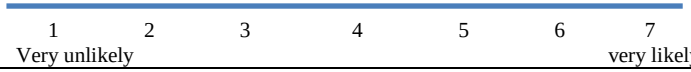
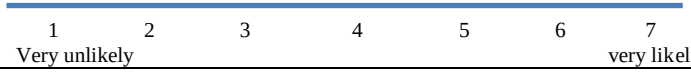
Below-mentioned questionnaire is the direct translation from the methodology part of the paper.
An email was sent to the author and unfortunately he would be back to his office not before 2nd August 2011.

HIV is transmitted by;			
- Vaginal intercourse.	Yes	No	I don't know
- Sharing needles and syringes.	Yes	No	I don't know
- Prenatal transmission.	Yes	No	I don't know

- Anal intercourse. - Oral intercourse. - Kissing. - Coughing or sneezing. - Using the same glass. - Eating together. - Mosquitoes. - Sharing toilets.	Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know
When I think of people with AIDS (PWA), I feel; -Fear -Irritation -Pity	 1 2 3 4 5 6 7 No fear at all — a lot of fear No irritation at all — a lot of irritation No pity at all — a lot of pity
When I think of commercial sex workers (CSW), I feel; -Fear -Irritation -Pity	 1 2 3 4 5 6 7 No fear at all — a lot of fear No irritation at all — a lot of irritation No pity at all — a lot of pity
When I think of men who visit female sex workers (MFSW), I feel; -Fear -Irritation -Pity	 1 2 3 4 5 6 7 No fear at all — a lot of fear No irritation at all — a lot of irritation No pity at all — a lot of pity
When I think of homosexuals, I feel; -Fear -Irritation -Pity	 1 2 3 4 5 6 7 No fear at all — a lot of fear No irritation at all — a lot of irritation No pity at all — a lot of pity
Perception of the risk	
Please indicate the risk of catching HIV in the following situations:	 1 2 3 4

-Someone drinks from a glass used by a homosexual.	No risk large risk
-Shaking hands with a commercial sex worker	1 2 3 4 No risk large risk
Refusal to engage in casual contact	
-If a commercial sex worker moved to my street, I would think that is	1 2 3 4 5 6 7 Very acceptable very unacceptable
-I would rather have a heterosexual person as my neighbor than a homosexual person.	1 2 3 4 5 6 7 Very unlikely very likely
Tendency to attribute responsibility to PWA	
-If someone has contracted HIV by unsafe sex it is their own fault.	1 2 3 4 5 6 7 Very unlikely very likely
-if someone has contracted HIV by blood transfusion it is their own fault.	1 2 3 4 5 6 7 Very unlikely very likely
Attitudes towards restricting policies for PWA	
-All AIDS patients should have to live in a special village.	1 2 3 4 Disagree strongly Strongly agree
-The names of people with AIDS should be made public so others can avoid to have contact with them.	1 2 3 4 Disagree strongly Strongly agree

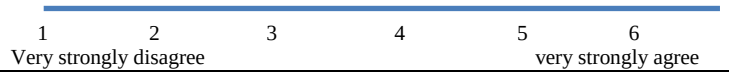
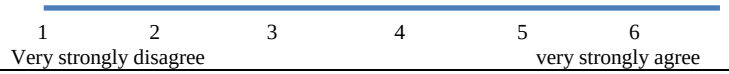
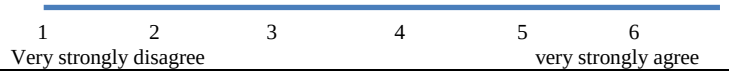
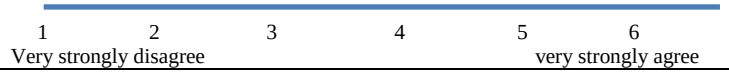
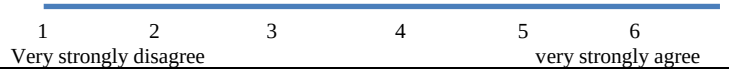
-People without AIDS must have priority for a new job.	
Motivation to protect from HIV infection	
-If you found out that you were HIV positive, how would you feel?	
Perceived vulnerability	
-I think that people who are having unsafe sex have a high risk of being infected with HIV.	
Response efficacy	
-If I have sex, using a condom can prevent me from HIV infection.	
-Having sex with one steady partner can reduce my chance of HIV infection.	
Self-efficacy of condom use	
-When I want to, I know that I can insist on using a condom.	
-Suppose that your sexual partner does not want to use a condom and you do want to do you think you could convince him/her to use one?	
Motivation to protect from HIV.	
-If I am sexually active, I intend to use a condom.	

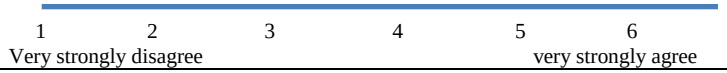
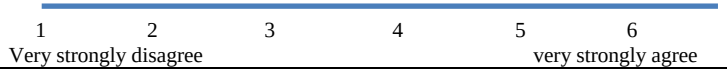
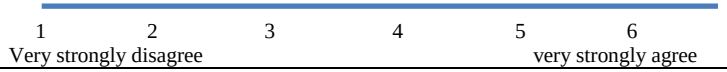
	
-I would avoid having sex with a person I don't know well.	

Development of a Yemeni AIDS Stigma Scale

An initial pool of **23 items** was generated based on existing sources. However, after an extensive review of the items, weighing the relative uniqueness, redundancy and contribution of these items, only **14** of them were chosen. **10items** were retained and factor analysis was executed again with the same rotation.

The data were collected from **318 college students** attending one of the public universities in Yemen, of whom 157 were males and 161 were females.

Factor I (a_0.71) ‘‘**rejection**’’	
1. People with AIDS should be fired from their jobs.	
2. It is difficult to sympathize with people living with HIV/AIDS.	
3. People living with HIV/AIDS should be quarantined.	
4. If a friend of mine got AIDS I would continue being a friend with him/her.	
5. It does not bother me if my classmate has AIDS.	

Factor II (a_0.71) ‘‘**shame and blame’’**	
6. People with HIV/AIDS make me angry.	
7. People with HIV/AIDS should be ashamed of themselves.	
8. People with HIV/AIDS are responsible for getting HIV/AIDS.	
9. It is shameful to have people with HIV/AIDS in Yemen.	
10. AIDS is a punishment from God.	

Measuring stigma in people with HIV: Psychometric assessment of the HIV stigma scale

An instrument to measure (40-item) the stigma perceived by people with HIV was developed. Items surviving two rounds of content review were assembled in a booklet and distributed through HIV-related organizations across the United States. Psychometric analysis was performed on **318 questionnaires** returned by **people with HIV.**

Four factors emerged from exploratory factor analysis**: personalized stigma**, **disclosure concerns**, **negative self-image**, and concern with **public attitudes toward people with HIV**.

This scale has been used by various researchers such as **Bunn et al. 2007. 157 individuals** living with HIV/AIDS in **Vermont and northern New England** were recruited. This study had aimed in reanalysis of the psychometric properties of Berger scale. As a result the scale was shortened from **40 to 32 items** by retaining the original four domains of the scale. The omitted items are highlighted in “Green”.

1. In many areas of my life, no one knows I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
2. I feel guilty because I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
3. People's attitudes make me feel worse about myself.	Strongly disagree	Disagree	Agree	Strongly agree
4. Telling someone I have HIV is risky.	Strongly disagree	Disagree	Agree	Strongly agree
5. People with HIV lose jobs when employers learn.	Strongly disagree	Disagree	Agree	Strongly agree
6. I work hard to keep my HIV a secret.	Strongly disagree	Disagree	Agree	Strongly agree
7. I feel I'm not as good as others because I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
8. I never feel ashamed of having HIV.	Strongly disagree	Disagree	Agree	Strongly agree
9. People with HIV are treated like outcasts.	Strongly disagree	Disagree	Agree	Strongly agree
10. Most people believe a person who has HIV is dirty.	Strongly disagree	Disagree	Agree	Strongly agree
11. Easier to avoid friendships than worry about telling.	The exact sentence to be extracted.			
12. Having HIV makes me feel unclean.	Strongly disagree	Disagree	Agree	Strongly agree
13. I feel set apart, isolated from the rest of the world.	Strongly disagree	Disagree	Agree	Strongly agree
14. Most people think a person with HIV is disgusting.	Strongly disagree	Disagree	Agree	Strongly agree
15. Having HIV makes me feel I'm a bad person.	Strongly disagree	Disagree	Agree	Strongly agree

16. Most people with HIV are rejected when others learn.	Strongly disagree	Disagree	Agree	Strongly agree
17. I am very careful whom I tell that I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
18. Some people who know I have HIV, have grown more distant.	Strongly disagree	Disagree	Agree	Strongly agree
19. I worry about people discriminating against me.	Strongly disagree	Disagree	Agree	Strongly agree
20. Most are uncomfortable around someone with HIV.	Strongly disagree	Disagree	Agree	Strongly agree
21. I never feel I need to hide the fact I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
22. I worry that people may judge me when they learn.	Strongly disagree	Disagree	Agree	Strongly agree
23. Having HIV in my body is disgusting to me.	Strongly disagree	Disagree	Agree	Strongly agree
24. I am hurt by how people reacted to learning I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
25. I worry people who know I have HIV will tell others.	Strongly disagree	Disagree	Agree	Strongly agree
26. I regret having told some people that I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
27. As a rule, telling others has been a mistake.	Strongly disagree	Disagree	Agree	Strongly agree
28. People avoid touching me if they know I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
29. People I care about stopped calling after learning.	Strongly disagree	Disagree	Agree	Strongly agree
30. Some told me HIV is what I deserve for how I lived.	Strongly disagree	Disagree	Agree	Strongly agree

31. Some fear they'll be rejected because of my HIV.	Strongly disagree	Disagree	Agree	Strongly agree
32. People don't want me around their children once they know.	Strongly disagree	Disagree	Agree	Strongly agree
33. People have physically backed away from me.	Strongly disagree	Disagree	Agree	Strongly agree
34. Some people act as though it's my fault I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
35. I have stopped socializing with some due to their reactions.	Strongly disagree	Disagree	Agree	Strongly agree
36. I Have lost friends by telling them I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
37. I told people close to me to keep my HIV a secret.	Strongly disagree	Disagree	Agree	Strongly agree
38. People who know I have HIV tend to ignore my good points.	Strongly disagree	Disagree	Agree	Strongly agree
39. People seem afraid of me because I have HIV.	Strongly disagree	Disagree	Agree	Strongly agree
40. Knowing, they look for flaws in your character.	Strongly disagree	Disagree	Agree	Strongly agree

Discrimination against people with AIDS: The public's perspective

This survey’s questionnaire was not accessible; however, the quoted questions are the direct translation from the text, where the sentence constructions for each of the questions were drawn from the gist of the concepts driven from the article.

1. The AIDS epidemic increases the discrimination against those with the virus or active disease.	Disagree	I don't know	Agree*
2. The AIDS epidemic has already set off a wave of antihomosexual sentiment and is leading to unfair discrimination against homosexuals.	Disagree	I don't know	Agree
3. There should be increasing in funding for AIDS research or maintaining it at present level.	Disagree	I don't know	Agree
4. Government would be spending more for AIDS research today, if the disease did not disproportionately affect homosexual men.	Disagree	I don't know	Agree
5. Controlling the spread of AIDS and identifying those who are infected with HIV should take precedence over concerns of personal privacy.	Disagree	I don't know	Agree
6. General civil liberties need to be suspended to slow the spread of the disease.	No	I don't know	Yes
7. Would you vote for a candidate in favor of strict laws against high-risk sexual activity?	Less likely		More likely
8. Would you favor a law making it a crime for a person with AIDS to donate blood?	No	I don't know	Yes
9. Would you favor making it a criminal offense for someone who knows she or he has AIDS to have sex with another person?	No	I don't know	Yes
10. The patients with AIDS are "offenders" who are getting their rightful due.	Disagree	I don't know	Agree
11. Those test positive for AIDS should be tattooed.	Disagree	I don't know	Agree

12. Those with AIDS should be treated as those with leprosy were in an earlier era, by being sent to far-off islands.	Disagree	I don't know	Agree
13. Foreigner visitors who are infected with HIV should be barred from entering the United States.	Disagree	I don't know	Agree
14. Those affiliated with AIDS disease should not be treated with compassion.	Disagree	I don't know	Agree
15. Working with someone with AIDS is a likely way to contract AIDS.	Disagree	I don't know	Agree
16. AIDS can be contracted by being coughed at or sneezed on.	Disagree	I don't know	Agree
17. AIDS can be contracted by drinking from a fountain.	Disagree	I don't know	Agree
18. AIDS can be contracted from a toilet seat.	Disagree	I don't know	Agree
19. AIDS can be contracted from sharing a telephone.	Disagree	I don't know	Agree
20. AIDS can be contracted from sharing a locker.	Disagree	I don't know	Agree
21. AIDS can be contracted from jointly handling money.	Disagree	I don't know	Agree
22. AIDS can be contracted by being touched by someone who has the disease.	Disagree	I don't know	Agree
23. Would work alongside a colleague with AIDS.	No	I don't know	Yes
24. Employers should have the right to fire a person for the mere reason of being HIV positive.	No	I don't know	Yes
25. Public-school employees should be dismissed if they are found to have AIDS.	No	I don't know	Yes

26. Children with AIDS should be barred from attendance.	Disagree	I don't know	Agree
27. Would you keep your own child out of school to avoid contact with a student with AIDS?	No	I don't know	Yes
28. AIDS can be contracted by sitting in a classroom with someone who has the disease.	No	I don't know	Yes
29. Are you at increased risk for contracting AIDS by living near a hospital or home for patients with AIDS?	No	I don't know	Yes
30. Would you be upset if a treatment center or housing center for patients with AIDS were located in your neighborhood?	No	I don't know	Yes
31. Would you favor isolating people with AIDS from the general community, public places and their neighborhoods?	No	I don't know	Yes
32. Would you support the policy which allows the landlords to evict those with the disease from their homes?	No	I don't know	Yes
33. AIDS can be spread by mosquitoes and other insects.	No	I don't know	Yes
34. Do you support government's banning discrimination against patients with AIDS on the part of hospitals?	No	I don't know	Yes
35. Do you support the principle that government should pay for uninsured AIDS patients receive from hospitals and physicians?	No	I don't know	Yes
36. Should physicians be allowed to make their own choices about whether to treat	No	I don't know	Yes

patients with AIDS?			
37. Do you see AIDS as the most important health problem facing the country?	No	I don't know	Yes
38. Do you feel personally affected by the AIDS epidemic?	No	I don't know	Yes
39. Do you know anyone who has or has had AIDS?	No		Yes
40. Are you at all worried about contracting AIDS?	No	I don't know	Yes

*The scaling is an assumption.

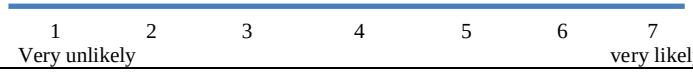
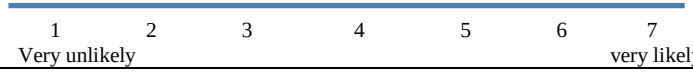
Accurate and inaccurate HIV transmission beliefs, stigmatizing and HIV protection motivation in northern Thailand

In Chiang Rai, northern **Thailand**, **219 respondents** filled in a structured questionnaire assessing:

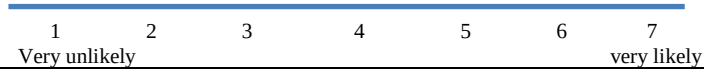
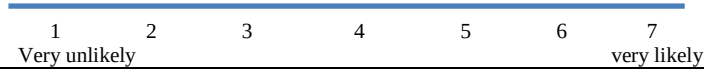
- accurate and inaccurate HIV transmission beliefs,
- emotional reactions towards PWA and AIDS risk groups,
- stigmatizing attitudes and
- motivation to protect from HIV

Below-mentioned questionnaire is the direct translation from the methodology part of the paper.
An email was sent to the author and unfortunately he would be back to his office not before 2nd August 2011.

HIV is transmitted by; - Vaginal intercourse. - Sharing needles and syringes. - Prenatal transmission. - Anal intercourse. - Oral intercourse. - Kissing. - Coughing or sneezing. - Using the same glass. - Eating together. - Mosquitoes. - Sharing toilets.	Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know Yes No I don't know
When I think of people with AIDS (PWA), I feel; -Fear -Irritation -Pity	 1 2 3 4 5 6 7 No fear at all a lot of fear No irritation at all a lot of irritation No pity at all a lot of pity
When I think of commercial sex workers (CSW), I feel; -Fear -Irritation -Pity	 1 2 3 4 5 6 7 No fear at all a lot of fear No irritation at all a lot of irritation No pity at all a lot of pity
When I think of men who visit female sex workers (MFSW), I feel; -Fear -Irritation -Pity	 1 2 3 4 5 6 7 No fear at all a lot of fear No irritation at all a lot of irritation No pity at all a lot of pity
When I think of homosexuals, I feel; -Fear -Irritation	 1 2 3 4 5 6 7 No fear at all a lot of fear

-Pity	No irritation at all No pity at all a lot of irritation a lot of pity
Perception of the risk	
Please indicate the risk of catching HIV in the following situations: -Someone drinks from a glass used by a homosexual.	
-Shaking hands with a commercial sex worker	
Refusal to engage in casual contact	
-If a commercial sex worker moved to my street, I would think that is	
-I would rather have a heterosexual person as my neighbor than a homosexual person.	
Tendency to attribute responsibility to PWA	
-If someone has contracted HIV by unsafe sex it is their own fault.	
-if someone has contracted HIV by blood transfusion it is their own fault.	
Attitudes towards restricting policies for PWA	
-All AIDS patients should have to live in a special village.	

-The names of people with AIDS should be made public so others can avoid to have contact with them.	1 2 3 4 Disagree strongly Strongly agree
-People without AIDS must have priority for a new job.	1 2 3 4 Disagree strongly Strongly agree
Motivation to protect from HIV infection	
-If you found out that you were HIV positive, how would you feel?	1 2 3 4 5 6 7 Not scared at all very scared
Perceived vulnerability	
-I think that people who are having unsafe sex have a high risk of being infected with HIV.	1 2 3 4 5 6 7 Very unlikely very likely
Response efficacy	
-If I have sex, using a condom can prevent me from HIV infection.	1 2 3 4 5 6 7 Very unlikely very likely
-Having sex with one steady partner can reduce my chance of HIV infection.	1 2 3 4 5 6 7 Very unlikely very likely
Self-efficacy of condom use	
-When I want to, I know that I can insist on using a condom.	1 2 3 4 5 6 7 Very unlikely very likely
-Suppose that your sexual partner does not want to use a condom and you do want to do you think you could convince him/her to use one?	1 2 3 4 5 6 7 Very unlikely very likely
Motivation to protect from HIV.	

-If I am sexually active, I intend to use a condom.	
-I would avoid having sex with a person I don't know well.	

Measuring HIV-AIDS stigma, CSSR working paper no.74

Judgmental attitudes and **fear of infection** are expressed with greater prevalence than intentions to discriminate against people living with HIV/AIDS (PLWHA). 5211 young adults (aged between 14 and 22) in June, July and August of 2002 were interviewed in **Cape Town South Africa**. 1301 of the initial respondents were re-interviewed between June and November of 2003 in the second wave.

1-Imagine that a hospital has only one free bed left, and two people with pneumonia need it. The one person is infected with HIV; the other is not infected with HIV. Who should get the bed? **Interviewer: Do not read out options**	1- The HIV positive person 2- The HIV negative person 3- It depends/other 4- Don't know
Interviewer read out: Please respond to the following questions by answering "Yes" or "No". If you are not sure, chose the "Probably Yes" or "Probably No" response. If you are quite sure, Choose the "Definitely Yes" or "Definitely No" response. **Interviewer: Do not read out "don't know" option**	
2- Do you think the government should provide free healthcare for people who need it?	Definitely yes Probably yes Probably no Definitely no Don't know*
3- Do you think the government should provide free healthcare for people with AIDS?	Definitely yes Probably yes Probably no Definitely no Don't know*
4-Would it be a good idea for the government to give job training to	Definitely yes Probably yes Probably no Definitely no Don't know*

unemployed young people?	
5- Should youth who are infected with HIV get this job training?	Definitely yes Probably yes Probably no Definitely no Don't know*
6-Should all people who are too sick to work get a welfare grant from the government?	Definitely yes Probably yes Probably no Definitely no Don't know*
7- Should someone with AIDS who is too sick to work get a welfare grant from the government?	Definitely yes Probably yes Probably no Definitely no Don't know*
8- Should a woman who got AIDS from sleeping around with many men get this welfare grant from the government?	Definitely yes Probably yes Probably no Definitely no Don't know*
9- Would you be willing to look after a close family member with AIDS?	Definitely yes Probably yes Probably no Definitely no Don't know*
10- Imagine that you find out that one of your friends is HIV infected. Would you still be friends with them?	Definitely yes Probably yes Probably no Definitely no Don't know*
11- Would you drink from the same bottle of water as healthcare professionals infected friend?	Definitely yes Probably yes Probably no Definitely no Don't know*
12- If you knew that a shopkeeper had HIV/AIDS, would you buy fresh vegetables from him or her?	Definitely yes Probably yes Probably no Definitely no Don't know*
13- Do you think it should be illegal for people with HIV/AIDS to put others at risk of infection through unprotected sex?	Definitely yes Probably yes Probably no Definitely no Don't know*
14- Do you think people with HIV/AIDS should have to disclose their HIV status to the person they are going to have sex with *even if they use*	Definitely yes Probably yes Probably no Definitely no Don't know*

a condom?					
15- Imagine you meet someone you really like and he/she tells you that he/she is HIV positive; would you still go out on a "date" with him/her?	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
16- If you loved HIV positive person, would you have sex with them using a condom?	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
17- Would you prefer to know who has HIV/AIDS in your community so that you can be careful not to get infected by them?	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
18- Do you worry that HIV is much easier to catch than we are told?	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
19- Would you rather not touch someone with HIV/AIDS because you are scared of infection?	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
20- Do you think the names of people with HIV/AIDS should be made public?	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
21- Do you think HIV/AIDS is a punishment for sleeping around?	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
22- Do you think that a school pupil with HIV puts other pupils in their class at risk of infection?	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
23- Do you think a school pupil with HIV should be allowed to attend school?	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
24- Do you think that many people who get HIV infected through sex have only themselves to blame?	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*

25- Do you think that some people with HIV/AIDS want to infect other people with the virus?	Definitely yes Probably yes Probably no Definitely no Don't know*

Development of a measure of attitudes toward persons with AIDS

AIDS Attitude Scale (AAS) was revised and its items were dropped from the original 83-items to 21 items after Principle Factor Analysis (PFA) and error estimation. Responses to the 21-item scale were collected from a variety of subjects, including graduate and undergraduates, nursing and education majors, private and public university students. Stability data were collected from one-week and three week repeated administrations of the scale.*

In 1996 the below-mentioned scale was further validated after being used in more than 30 researches. Attitudes towards persons with AIDS, as measured by the AAS, appear independent of how much knowledge nurses have which offers strong discriminant support for validity of the AAS.

In 2001 Froman et al conducted a research detailing the development and validation of an alternate form of the *AAS,* the ***AAS-G***, intended for use with the general public. The *AAS-G* may be completed by lay members of the community and is not limited to assessing attitudes toward patients alone. Participants were recruited and data collected from a variety of settings, including workplace, athletic events, social gatherings, and church events in urban and rural settings in the northeastern U.S. Respondents in the sample represented a mixed group of individuals, including healthcare providers, other professionals, and lay people.

1. Most people with AIDS only have themselves to blame.
2. Most people with AIDS deserve what they get.

3. Patients who are HIV positive should be put in rooms with other patients.
4. If I were assigned a patient With AIDS, l would worry about putting my family and friends at risk of contracting the disease.
5. Young children should be removed from the home if one of the parents is HIV positive.
6. I think patient with AIDS have the right to the same quality of care as other patients.
7. It is especially important to work with patients with AIDS in a caring manner.
8. I think people who are IV drug abusers deserve to get AIDS.
9. I think women who give birth to babies who are HIV positive should prosecuted for child abuse.
10. Homosexuality should be illegal.
11. I feel more sympathetic toward people who get AIDS from blood transfusions than those who get it from IV drug abuse.
12. A homosexual patient's partner should be accorded the same respect and courtesy as a partner of a heterosexual patient.
13. Patients with AIDS should be treated with the same respect as any other patients.
14. If I found out that a friend of mine was homosexual, I would not maintain the friendship.
15. I am worried about getting AIDS from social contact with someone.
16. I'm sympathetic toward the misery that people with AIDS experience.
17. I would like to do something to make life easier for people with AIDS.

18. I would do everything I could to give the best possible care to an AIDS patient.
19. Children or people who get AIDS from a blood transfusion are more deserving of treatment than those who get it from IV drug abuse.
20. I would be worried about children getting AIDS if I knew that one of the school teachers was a homosexual.
21. I have little sympathy for people who get AIDS from sexual promiscuity.

*Results from content validation, factor analysis, classical reliability estimation and generalizability analysis show the AAS to have strong psychometric properties. The two-factor scoring solution, providing information about both positive (Empathy) and negative (Avoidance) attitudes can be used to focus interventions and to assess outcomes. Finally, it is suggested that the AAS may be used across helping professions and is not limited to nursing.The use of the *AAS-G* in studies of attitudes toward PWA who are not necessarily patients, or in studies enrolling participants who are not healthcare providers, is endorsed.

AAS-G (AIDS Attitude Scale for use in General public)

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2. Most people with AIDS deserve what they get.
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Development of a measure of willingness to provide nursing care to AIDS patients

This **Nursing Willingness Questionnaire (NWQ)** a 13-item self –report instrument beginning by a 370 words already validated vignette was administered to 60 male and 452 female nurses at 5 different hospitals.

The NWQ instrument is a validated questionnaire now.

A gist of the vignette:

"Mark is a male patient who has experienced deteriorating health over the past six months and eventually was diagnosed with AIDS. He has lived with a male companion for nine years. He was admitted to the hospital with a diagnosis of pneumocystis pneumonia. He has elevated temperature. His respirations are labored and he is perspiring heavily. He has an IV drip and external condom catheter, has vomited and is incontinent of stool. He is confused and restrained by a posey vest.

1. How willing would you be to give Mark a bed bath?	Not at all — Uncertain — Extremely willing 0 — 4-5 — 9-10
2. How willing would you be to clean up stools and emesis, using gloves?	
3. Would you bring a meal tray into Mark's room?	
4. Would you change Mark's bed linen?	

5. Would you take Mark's vital signs?	
6. Would you be willing to change Mark's dressings, using gloves?	
7. Would you be willing to clean supplies, using the gloves after the physician completes a diagnostic procedure?	
8. Would you feed dinner to Mark?	
9. Would you complete catheter care using gloves?	
10. Would you shave Mark?	
11. Would you empty the urinary drainage bag, using gloves?	
12. Would you start IV fluids using gloves?	
13. Would you administer a blood transfusion, using gloves?	

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10. Would you shave Mark?	
11. Would you empty the urinary drainage bag, using gloves?	
12. Would you start IV fluids using gloves?	
13. Would you administer a blood transfusion, using gloves?	

Blendon, Donelan 1988

Discrimination against people with AIDS: The public's perspective

This survey's questionnaire was not accessible; however, the quoted questions are the direct translation from the text, where the sentence constructions for each of the questions were drawn from the gist of the concepts driven from the article. This article reports the findings of several international and national surveys conducted between 1983 and 1988.

1. The AIDS epidemic increases the discrimination against those with the virus or active disease.	Disagree	I don't know	Agree*
2. The AIDS epidemic has already set off a wave of antihomosexual sentiment and is leading to unfair discrimination against homosexuals.	Disagree	I don't know	Agree
3. There should be increasing in funding for AIDS research or maintaining it at present level.	Disagree	I don't know	Agree
4. Government would be spending more for AIDS research today, if the disease did not disproportionately affect homosexual men.	Disagree	I don't know	Agree
5. Controlling the spread of AIDS and identifying those who are infected with HIV should take precedence over concerns of personal privacy.	Disagree	I don't know	Agree
6. General civil liberties need to be suspended to slow the spread of the disease.	No	I don't know	Yes

7. Would you vote for a candidate in favor of strict laws against high-risk sexual activity?	Less likely		More likely
8. Would you favor a law making it a crime for a person with AIDS to donate blood?	No	I don't know	Yes
9. Would you favor making it a criminal offense for someone who knows she or he has AIDS to have sex with another person?	No	I don't know	Yes
10. The patients with AIDS are "offenders" who are getting their rightful due.	Disagree	I don't know	Agree
11. Those test positive for AIDS should be tattooed.	Disagree	I don't know	Agree
12. Those with AIDS should be treated as those with leprosy were in an earlier era, by being sent to far-off islands.	Disagree	I don't know	Agree
13. Foreigner visitors who are infected with HIV should be barred from entering the United States.	Disagree	I don't know	Agree
14. Those affiliated with AIDS disease should not be treated with compassion.	Disagree	I don't know	Agree
15. Working with someone with AIDS is a likely way to contract AIDS.	Disagree	I don't know	Agree
16. AIDS can be contracted by being coughed at or sneezed on.	Disagree	I don't know	Agree
17. AIDS can be contracted by drinking from a fountain.	Disagree	I don't know	Agree
18. AIDS can be contracted from a toilet seat.	Disagree	I don't know	Agree
19. AIDS can be contracted from sharing a telephone.	Disagree	I don't know	Agree

20. AIDS can be contracted from sharing a locker.	Disagree	I don't know	Agree
21. AIDS can be contracted from jointly handling money.	Disagree	I don't know	Agree
22. AIDS can be contracted by being touched by someone who has the disease.	Disagree	I don't know	Agree
23. Would work alongside a colleague with AIDS.	No	I don't know	Yes
24. Employers should have the right to fire a person for the mere reason of being HIV positive.	No	I don't know	Yes
25. Public-school employees should be dismissed if they are found to have AIDS.	No	I don't know	Yes
26. Children with AIDS should be barred from attendance.	Disagree	I don't know	Agree
27. Would you keep your own child out of school to avoid contact with a student with AIDS?	No	I don't know	Yes
28. AIDS can be contracted by sitting in a classroom with someone who has the disease.	No	I don't know	Yes
29. Are you at increased risk for contracting AIDS by living near a hospital or home for patients with AIDS?	No	I don't know	Yes
30. Would you be upset if a treatment center or housing center for patients with AIDS were located in your neighborhood?	No	I don't know	Yes
31. Would you favor isolating people with AIDS from the general community, public places and their neighborhoods?	No	I don't know	Yes

32. Would you support the policy which allows the landlords to evict those with the disease from their homes?	No	I don't know	Yes
33. AIDS can be spread by mosquitoes and other insects.	No	I don't know	Yes
34. Do you support government's banning discrimination against patients with AIDS on the part of hospitals?	No	I don't know	Yes
35. Do you support the principle that government should pay for uninsured AIDS patients receive from hospitals and physicians?	No	I don't know	Yes
36. Should physicians be allowed to make their own choices about whether to treat patients with AIDS?	No	I don't know	Yes
37. Do you see AIDS as the most important health problem facing the country?	No	I don't know	Yes
38. Do you feel personally affected by the AIDS epidemic?	No	I don't know	Yes
39. Do you know anyone who has or has had AIDS?	No		Yes
40. Are you at all worried about contracting AIDS?	No	I don't know	Yes

*The scaling is an assumption.

Validation of the HIV/AIDS Stigma Instrument - PLWA (HASI-P)

This instrument is designed to **measure perceived stigma**, create a baseline from which to **measure changes in stigma over time**, and track potential progress towards reducing stigma. It was developed in three phase:

1- generating items based on results of focus group discussions;
2- pilot testing and reducing the original list of items; and
3- Validating the instrument.

Data for all phases were collected from **five African countries**: **Lesotho, Malawi, South Africa, Swaziland** and **Tanzania**. The instrument was validated with a sample of **1,477 persons living with** HIV/AIDS from all of the five countries.

The research team will soon report on an instrument to measure perceived stigma among nurses, titled HIV/AIDS Stigma Instrument-Nurse (HASI-N).

In the past 3 months, how often did the following events happen *because of your HIV status?*	0=Never	1=Once or twice	2=Several times	3=Most of the time
Verbal abuse				
Someone scolded me.	0=Never	1=Once or twice	2=Several times	3=Most of the time
Someone insulted me.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I was blamed for my HIV status.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I was told that I have no future.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I was told that God is punishing me.	0=Never	1=Once or twice	2=Several times	3=Most of the time

I was called bad names.	0=Never	1=Once or twice	2=Several times	3=Most of the time
Someone mocked me when I passed by.	0=Never	1=Once or twice	2=Several times	3=Most of the time
People sang offensive songs when I passed by.	0=Never	1=Once or twice	2=Several times	3=Most of the time
Negative Self-Perception				
I felt completely worthless.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I felt ashamed of having this disease.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I felt that I am no longer a person.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I felt that I brought a lot of trouble to my family.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I felt that I did not deserve to live.	0=Never	1=Once or twice	2=Several times	3=Most of the time
Healthcare Neglect				
I was discharged from the hospital while still needing care.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I was shuttled around instead of being helped by a nurse.	0=Never	1=Once or twice	2=Several times	3=Most of the time
In the hospital or clinic, my pain was ignored.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I was refused treatment because I was told I was going to die anyway.	0=Never	1=Once or twice	2=Several times	3=Most of the time
At the hospital, I was left in a soiled bed.	0=Never	1=Once or twice	2=Several times	3=Most of the time

I was denied healthcare.	0=Never	1=Once or twice	2=Several times	3=Most of the time
At the hospital/clinic, I was made to wait until last.	0=Never	1=Once or twice	2=Several times	3=Most of the time
Social Isolation				
People cut down visiting me.	0=Never	1=Once or twice	2=Several times	3=Most of the time
People ended their relationships with me.	0=Never	1=Once or twice	2=Several times	3=Most of the time
A friend would not chat with me.	0=Never	1=Once or twice	2=Several times	3=Most of the time
Someone stopped being my friend.	0=Never	1=Once or twice	2=Several times	3=Most of the time
People avoided me.	0=Never	1=Once or twice	2=Several times	3=Most of the time
Fear of Contagion				
I was told to use my own eating utensils.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I was made to drink last from the cup.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I stopped eating with other people.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I was asked to leave because I was coughing.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I was made to eat alone.	0=Never	1=Once or twice	2=Several times	3=Most of the time
I was asked not to touch someone's child.	0=Never	1=Once or twice	2=Several times	3=Most of the time

Workplace Stigma				
Someone tried to get me fired from my job.	0=Never	1=Once or twice	2=Several times	3=Most of the time
My employer denied me opportunities.	0=Never	1=Once or twice	2=Several times	3=Most of the time

Development and validation of a culturally appropriate HIV/AIDS Stigma Scale for Puerto Rican health professionals in training

We based our items on previous qualitative interviews carried out with 80 Puerto Rican health professionals**.** The resulting scale was composed of **68 items**. During the validation process of the measurement tool the number of items were reduced to **44**.

The highlighted items were reduced during the validation process.

421 health professionals in training equally divided among the fields of **medicine, nursing, psychology, and social work**. (No pharmacists).

Fear of infection					
1. I would feel comfortable being operated on by a surgeon with HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
2. I would not use the eating utensils of a person with HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
3. I would be worried if I had to give blood in a laboratory where they provide services to a lot of people with HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
4. I would use the services of a dentist that sees many people with	Strongly disagree	Disagree	not sure	Agree	Strongly agree

HIV/AIDS.					
5. It is recommended that health professionals in emergency rooms use double gloves when providing services to people with HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
6. It would scare me to discover that I had sexual relationships with someone who has HIV/AIDS, even when I used protection.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
7. I would prefer not to sit on a toilet that has been used by people with HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
15. I would think twice before eating in a restaurant in which the person that cooks has HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
Body signs of HIV/AIDS					
16. I can identify if a person has HIV/AIDS by looking at his/her body.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
17. The bodies of the people who ask for money at street lights make me think that they have HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
18. Due to the training that health professionals have it is easier for them to identify who has HIV/AIDS by looking at their bodies.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
27. On occasions, I have seen extremely skinny people and thought they had HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
42. It is impossible to identify if someone has HIV/AIDS by looking at their bodies.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
PLWHA as vectors of infection					
21. A mother who has HIV/AIDS is a risk to her daughters/sons already born.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
22. A mother who has HIV/AIDS should avoid physical contact with her daughters/sons to prevent a possible infection.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
23. People with HIV/AIDS could be a threat to public health.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
24. There are a lot of people with HIV/AIDS who seek to infect others.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
25. People with HIV/AIDS in Puerto Rico could control the future of the epidemic in our country if they want to.	Strongly disagree	Disagree	not sure	Agree	Strongly agree

Closeness to death					
30. People with HIV/AIDS are closer to death.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
31. People with HIV/AIDS should not adopt children because they could leave them orphaned.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
32. People with HIV/AIDS who take their medications defer their death.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
33. If I were diagnosed with HIV it will worry me how much time I had left to live.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
34. A baby of a mother with HIV/AIDS has a shorter life expectancy than one without HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
Lack of productivity of PLWHA					
44. People who do not have HIV/AIDS can work for longer periods of time than those that are infected.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
45. HIV/AIDS negatively impacts the productivity of a person.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
46. People with HIV/AIDS should be assigned with tasks that do not require a lot of physical activity, even if they do not ask for it.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
47. A person with HIV/AIDS gets tired faster than one that does not have it.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
Rights of PLWHA					
8. A person with HIV/AIDS has the right to not reveal his/her status to other people.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
35. People with HIV/AIDS should not adopt children.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
36. People with HIV/AIDS have the right to confidentiality.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
37. People with HIV/AIDS should be penalized if they have sexual relations without revealing their health status.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
39. All people with HIV/AIDS should have access to free medications paid by the state.	Strongly disagree	Disagree	not sure	Agree	Strongly agree

40. The rights of people with HIV/AIDS should be limited so that they are not allowed to work in health scenarios.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
41. People with HIV/AIDS should have health services, but in accordance to available resources, as these are very expensive.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
43. People with HIV/AIDS should be obliged to reveal their health condition to their doctor.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
PLWHA obliged to reveal serostatus					
19. There should be a law that forces people with HIV/AIDS to reveal their status to their sexual partners.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
20. It is unforgivable that PLWHA do not reveal their status to their sexual partners.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
38. The fact that a person with HIV/AIDS does not reveal his/her status to a sexual partner is equivalent to murder.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
51. A person with HIV/AIDS should be obliged to reveal their status to health professionals so they can take the proper precautions.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
64. The right of the family to know the HIV status of one of its members is above the right of the infected person to not reveal it.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
Responsibility for infection					
9. People who are infected with HIV through drug use could have avoided it if they wanted to.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
10. Drug users who are infected with HIV asked for it.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
11. I would not be surprised if a promiscuous person got infected with HIV.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
12. Homosexuals are predominantly responsible for the HIV/AIDS epidemic.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
13. Little information on HIV/AIDS makes people become infected.	Strongly disagree	Disagree	not sure	Agree	Strongly agree

14. A woman who stays with her husband even when he is unfaithful should not be sorry if she becomes infected with HIV.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
Personal characteristics of PLWHA					
57. Infection with HIV is the direct result of people's promiscuity.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
58. People get infected with HIV because they have been irresponsible with their healthcare.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
59. A person with weak character has more probability of being infected with HIV.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
60. Having religious beliefs reduces the risks of getting HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
Emotions associated with HIV/AIDS					
28. I feel sorry for the woman who while being faithful, is infected with HIV by her partner.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
29. I admire people with HIV/AIDS who take care of their health responsibly.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
48. I feel sorry for the people who have HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
49. I do not feel sorry for drug users who get infected with HIV.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
67. I feel sorry for homosexuals with HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
68. I feel sorry for the children infected with HIV.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
Need to control PLWHA					
26. Children with HIV/AIDS in schools should be together in the same classroom.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
61. There should be legislation to sterilize women with HIV/AIDS so they do not have children.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
62. All people with HIV/AIDS should have an ID with them in case that	Strongly disagree	Disagree	not sure	Agree	Strongly agree

they are taken to an emergency room.					
63. The Health Department should have an updated registry with the first and last names of all the people with HIV/AIDS.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
65. There should be legislation so that people with HIV/AIDS cannot get married.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
66. There should be a law that forces people with HIV/AIDS to reveal their status to their sexual partners.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
Structural concerns					
50. People get infected with HIV regardless of their formal education levels.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
52. People with many economical resources become infected with the same frequency as those with low resources.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
53. HIV/AIDS impact equal amounts of men and women.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
54. People don't use condoms to protect themselves even though they are easily accessible.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
55. Drug users don't use clean needles to Project themselves from HIV/AIDS although they are easily available.	Strongly disagree	Disagree	not sure	Agree	Strongly agree
56. In Puerto Rico, there is higher risk of infection with HIV in the metropolitan area, than in the rural area.	Strongly disagree	Disagree	not sure	Agree	Strongly agree

Technical meeting November 2009

Overall, meeting participants achieved agreement on the critical areas that need to be measured when assessing HIV stigma and discrimination. Importantly, meeting participants noted that all individuals could stigmatize or be stigmatized, so it was agreed that it would be important to measure the following areas among all target populations, where relevant:

- Fear of infection through casual contact;
- Prejudice and stereotypes;

- Anticipated stigma;
- Internalized stigma;
- Experienced stigma; and
- Stigma by association (i.e. discrimination experienced for associating with or caring for people living with HIV or a person involved in sex work, drug use or same sex activities).

Items proposed to measure fear of contagion:

Fear of physical proximity/contact
I would feel OK sitting next to a person living with HIV.
I would avoid touching a person living with HIV.
I would worry about letting someone with HIV hold my child.
Fear of sharing items
I would worry about (feel okay) touching the clothes of someone living with HIV
I would worry about sleeping next to a family member living with HIV
Fear of 'ingesting'
I would worry about drinking from the same glass as a person living with HIV.
I would worry about eating food prepared by a person living with HIV.
I would worry about buying food from a person living with HIV.
Fear of social proximity
I would not invite a relative living with HIV to my wedding
I would not invite a friend living with HIV to my wedding
I would prefer that people living with HIV not attend my place of worship

Items proposed to measure stereotypes

Prejudice
General negative judgment/affect:
Thermometer Questions: Sympathy, Compassion, Indifference, Discomfort, Fear, Anger, Disgust
Shame/blame:
People with HIV/AIDS should be ashamed of themselves.
I would be ashamed if someone in my family had HIV/AIDS.
People who have HIV/AIDS got what they deserve.
Behavioral intent:
I would end my friendship if my friend had AIDS.

People with HIV/AIDS deserve the same quality of healthcare as other patients.
People with HIV/AIDS should be prevented from having children.
The names of people with HIV/AIDS should be disclosed (or made public).
(Question on forced testing, perhaps: Members of groups that have high levels of HIV should be forced to be tested. Problematic to ask: People suspected of having HIV should be forced to be tested because there may be some situations, i.e. sexual assaults, in which people might agree without it necessarily being based in prejudice)
People with HIV should be kept out of <insert setting>. Examples of social contexts: work, education, faith/religious groups, health services (general, dental, and sexual / reproductive), housing, social gatherings
Stereotypes
People with HIV/AIDS are promiscuous.
People with HIV/AIDS engage in immoral (deviant) behavior. OR People with HIV/AIDS engage in behavior that I don't approve of.
Most people with AIDS don't care if they infect other people with the AIDS virus.
Questions specific to groups: MSM / gay men, sex workers, IDUs, etc.

Proposed items for PLHIV anticipated and internalized stigma, experienced stigma

Anticipated stigma:
People living with HIV/AIDS face neglect from their family
People want to be friends with someone who has HIV/AIDS
People who are suspected of having HIV/AIDS lose respect in the community
Most employers would not hire someone with HIV to work with them
If I told my regular (sexual) partners that I have HIV/AIDS, she/he would leave me

I worry that people would verbally abuse or tease me if they knew I had HIV
I worry that people may judge me when they learn that I have HIVAIDS
I worry about people discriminating against me (because of my HIV status)
I am concerned that if I am sick people I know will find out about my HIV
I worry that I will not get as good healthcare because I'm HIV positive person
Because of my HIV people would not date me
I worry that people who know I have HIV will tell others
Internalized stigma:
Having HIV/AIDS makes me feel that I'm a bad person.
I feel guilty because I have HIV/AIDS
I have isolated myself from family and friends because I have HIV
I blame myself for my HIV infection
I feel that I do not deserve to live
I am comfortable disclosing my HIV status
Getting HIV is a punishment for bad behavior
I would understand if people rejected my friendship because I am HIV positive
Social distancing/Isolation: *intimate family /partner*
Some family members have rejected me because of my illness (Fife and Wright 2000)
How often have you experienced sexual rejection because of your HIV positive status (GNP + 2005)
Social distancing/Isolation: *larger social*
Due to my illness others seem to feel awkward and tense when they are around me (Fife and Wright 2000)
People don't want me around their children once they know I have HIV/AIDS (Berger 2001)
Physical distancing: *contact (needs to be adjusted to social/cultural/epidemic context)*
People have physically backed away from me because I have HIV (Berger/Bunn 2007)
People avoid touching me if they know I have HIV/AIDS (Berger/Bunn 2007)
Verbal abuse: *direct*
People mocked me when I passed by (Holzemer 2007)
Verbal abuse: *indirect*

In the last 12 months, how often have you been aware of being gossiped about (GNP + 2005)
Physical abuse:
Has a healthcare professionals ever coerced you into being sterilized since you were diagnosed as HIV-positive (GNP +)
In the last 12 months how often have you been physically assaulted (due to your HIV status) (GNP + 2005).
Denial/Inferior services: *Health*
At the general hospital/clinic I was made to wait until last (due to HIV status) (Holzemer 2007)
Denial/Inferior services: *Education*
How often has your children been dismissed, suspended or prevented from attending an educational institution because of your HIV status (GNP + 2005)—needs to be adapted for population
Denial/Inferior services: *Housing*
In the past 12 months, how often have you been forced to change your place of residence or been unable to rent accommodation (GNP + 2005)
Denial/Limitation of employment:
My job security has been affected by illness (Fife and Wright 2000)

Sample for the proposed scales:

PLHIV				
In the <u>past twelve months</u>, how frequently have the following happened? (select one response for each item)	Frequently 4	Occasionally 3	Rarely 2	Never 1
1- I have been neglected (avoided, ignored or overlooked?) by healthcare workers [family and friends]* because I am HIV+.	Frequently 4	Occasionally 3	Rarely 2	Never 1
2- I have been denied care by healthcare providers, [family and friends]* because I am HIV+.	Frequently 4	Occasionally 3	Rarely 2	Never 1
3- I have felt that healthcare workers, [families, and friends]* are afraid of me because I am HIV+.	Frequently 4	Occasionally 3	Rarely 2	Never 1

Healthcare Worker Being Stigmatized				
In the past twelve months, how frequently have the following happened? (select one response for each item)	Frequently 4	Occasionally 3	2	Rarely 1	Never
1- I have been neglected by healthcare workers, [family and friends]* because I care for people living with HIV.	Frequently 4	Occasionally 3	2	Rarely 1	Never
2- I have been denied social exchanges and friendships because people know that I care for people living with HIV.	Frequently 4	Occasionally 3	2	Rarely 1	Never
3- I have felt that people are afraid of me because they think they can get HIV from me because I care for people living with HIV.	Frequently 4	Occasionally 3	2	Rarely 1	Never
Healthcare Worker Stigmatizing				
In the past twelve months, how frequently have the following happened?	Frequently 4	Occasionally 3	2	Rarely 1	Never
I have neglected (avoided?) interacting with patients [healthcare workers] because they are HIV positive.	Frequently 4	Occasionally 3	2	Rarely 1	Never
I have observed healthcare workers neglecting patients because they are HIV positive (may not be acceptable in some cultures).	Frequently 4	Occasionally 3	2	Rarely 1	Never
I have denied care to patients because they are HIV positive.	Frequently 4	Occasionally 3	2	Rarely 1	Never
I have observed healthcare workers denying care to patients because they are HIV positive.	Frequently 4	Occasionally 3	2	Rarely 1	Never
Community Stigma				
In the past twelve months, how frequently have the following happened?	Frequently 4	Occasionally 3	2	Rarely 1	Never
I see persons living with HIV being neglected by their healthcare workers, [family, and friends]* because they are HIV positive.	Frequently 4	Occasionally 3	2	Rarely 1	Never
I see HIV+ persons being denied care by healthcare workers, [family, and friends]* because they are HIV positive.	Frequently 4	Occasionally 3	2	Rarely 1	Never
I see people being afraid of catching HIV from HIV infected persons [healthcare workers, family members, and friends]*.	Frequently 4	Occasionally 3	2	Rarely 1	Never

Public reactions to AIDS in the United States: a second decade of stigma.

Computer-assisted telephone interviews were conducted by the staff of the Survey Research Center at the University of California at Berkeley between September 12, 1990, and February 13, 1991.

Four different manifestations of stigma were assessed:

(1) **Negative feelings** toward persons with AIDS (the extent to which respondents felt angry at them, afraid of them, and disgusted by them),

(2) **Support for coercive AIDS-related policies** (quarantine and making public the names of people with AIDS),

(3) **Blame** for persons with AIDS, and

(4) **Intentions to avoid** a person with AIDS in four different situations.

1. Feelings towards people with AIDS; Angry Disgusted Afraid	 Very Very Very	 Somewhat Somewhat Somewhat	 A little A little A little	 Not at all Not at all Not at all
2. People with AIDS should be legally separated from others to protect the public health.	Agree strongly	Agree somewhat	Disagree somewhat	Disagree strongly
3. The names of people with AIDS should be made public so that others can avoid them.	Agree strongly	Agree somewhat	Disagree somewhat	Disagree strongly
4. People who got AIDS through sex or drug use have gotten what they	Agree strongly	Agree somewhat	Disagree somewhat	Disagree strongly

deserve.	
5. How would you behave; -If a close friend had AIDS -If you had a young child attending school where one of the students was known to have AIDS. -If you had an office job where one of the men working with you developed AIDS. -If the owner of neighborhood grocery store where you like to shop had AIDS.	Would avoid Would support Would avoid Would support Would avoid Would support Would avoid Would support
6. How likely it is that a person could get AIDS or AIDS virus infection through: -Kissing person with HIV on neck. -Sharing drinking glass with person with HIV. -Using public toilets. -Being coughed on or sneezed on by person with HIV. -Mosquito or other insect bites	Very likely Somewhat likely Somewhat unlikely Very unlikely Impossible
7. Think of two healthy homosexual men-neither of whom is infected	

with AIDS virus. Now suppose they have sexual intercourse; -If they use condoms, what would you say is the likelihood that at least one of them will become infected? -Now suppose the same two healthy men have sexual intercourse, but this time they don't use condoms. 8. Now think of someone who uses drugs intravenously (and who is not a homosexual). -If this person does not share needles, what do you think this person's chances are of becoming infected with the AIDS virus	A: Almost sure to get infected B: Has a fairly strong chance C: Very little chance D: No chance A: Almost sure to get infected B: Has a fairly strong chance C: Very little chance D: No chance

Scale: AIDS Knowledge Chan Kit Yi

	Yes	**No**	**Don't Know**
1) AIDS is a set of symptoms resulting from the damages to human immune systems.	1	2	3
2) There is no cure for HIV/AID.	1	2	3

3) HIV can be transmitted by blood and blood products	1	2	3
4) HIV can be transmitted by casual contact with persons who are HIV carrier.	1	2	3
5) Sexual transmission of HIV occur in both homosexual and heterosexual relationships	1	2	3
6) Consistent use of condoms may decrease transmission of the HIV	1	2	3
7) Healthcare workers who are pregnant and use proper precautions are still at increased risk of contracting the HIV	1	2	3
8) The AIDS virus is found in high concentrations in blood, semen and vaginal secretions.	1	2	3
9) There is no drug to treat or control the majority of the complications resulting from HIV infection	1	2	3
10) Wearing medical latex gloves is not one of the effective means of protecting oneself from HIV-infection	1	2	3
11) To prevent HIV-infection, appliances used for treating the HIV/AIDS patients should be sterilized	1	2	3
12) HIV can be transmitted through unsafe oral sex	1	2	3
13) HIV can be transmitted through mouth-to-mouth kissing	1	2	3
14) HIV can be transmitted through mosquito bites HIV	1	2	3
15) Universal precautions (all blood and body fluids are treated as potentially infectious) are the major precaution of infection control applicable to taking care patients of HIV/AIDS	1	2	3
16) Using barrier to avoid direct contact with blood and body fluid is a major precaution of infection control applicable to taking care of patients with HIV/AIDS	1	2	3

17) Most of HIV-infected people will progress to AIDS in 8- 12 years time without any treatment	1	2	3
Please circle the right answer.			
18) The window periods, i.e. time taken from HIV infection to positive HIV antibody test is usually a) less than 3 months b) 3-6 months c) 7-9 months d) more than 9months			
19) The chance of being infected by healthcare professionals-contaminated needle-stick injury is a) less than 1% b) 5% c) 10% d) 20%			
20) In Hong Kong the risk of HIV-infected woman transmitting the infection to her infant is a) less than 10 % b) 10-40% c) 41%-64%, d) 65%-90% e) more than 90%			

Scale: Stigmatizing Attitudes Chan Kit Yi

1: Strongly Disagree 2: Disagree 3: Slightly Disagree 4: Slightly Agree 5: Agree 6: Strongly Agree

21) All HIV-infected patients should be isolated from other patients in the wards.
22) I should have the right to refuse to care for a patient with HIV/AIDS.
23) I am reluctant to have physical contact with patients with HIV/AIDS to whom I provide the care.
24) The workers in my profession should keep HIV positive persons' particulars confidential.
25) I would have to ask for a transfer to another unit if I had to care for a patient with HIV/AIDS on a regular basis.
26) I would feel uncomfortable treating patients with HIV/AIDS.
27) Patients with HIV/AIDS are revolting.
28) Having a co-worker with HIV/AIDS would not bother me.
29) I am sympathetic to patients with HIV/AID.
30) I feel more angry when caring for a patient with HIV/AIDS than a patient with infectious hepatitis.
31) Healthcare agencies should have the right to refuse to provide care to patients with HIV/AIDS.
32) Patients with HIV/AIDS are to be blamed for their condition.
33) Nurses should be assigned to care for patients with HIV/AIDS on a voluntary basis only.

34) All healthy HIV-infected health workers should be excluded from clinical work.
35) Patients with HIV/AIDS have the right to the same quality of care as any other patient.

Scale: Fear of Contagion

1: Strongly Disagree 2: Disagree 3: Slightly Disagree 4: Slightly Agree 5: Agree 6: Strongly Agree

36) I am more frightened when caring for a patient with HIV/AIDS than a patient with other infectious diseases.
37) I am fearful of contracting HIV when caring for patient with HIV/AIDS
38) The major concerns I have about caring for a patient with HIV/AIDS are “will I get AIDS?
39) If I care for patients with HIV/AIDS, I shall worry about putting my family, friends, or colleagues at risk.
40) I would refuse to care for patients with HIV/AIDS.
41) I am willing to take care of patients with HIV/AIDS.
42) If I am allowed to choose, I will not choose to serve patients with HIV/AIDS.

SACAA Scale (Stigma Against Children Affected by AIDS (SACAA): Psychometric Evaluation of a Brief Measurement Scale)

Instruction: The following are possible attitudes towards children of people living with HIV/AIDS (PLWHA); please indicate that in your opinion how many people in the society would have such attitudes:
(Response option: **4 = most people, 3 = some people, 2 = few people, and, 1 = none**).

1. People think children of PLWHA should leave their villages.
2. People do not think children of PLWHA deserve sympathy.
3. People think children of PLWHA should quit school or never go to school.
4. People are unwilling to take care of children of PLWHA.
5. People think children of PLWHA should only live with children of PLWHA.
6. People do not want their children to play with children of PLWHA.
7. People think children of PLWHA should only play with children of PLWHA.
8. People think children of PLWHA are unclean.
9. People think children of PLWHA may have disease.
10. People do not think children of PLWHA can be as good as other children.

Shrum et al 1989 (AAS)

This scale was developed in 2 phases. Each time **college students** were recruited to fill in the questionnaire.

The final 54 items are listed below.

5-likert scale was used for each of the questions.

1- Strongly disagree with the statement
2- Disagree with the statement
3- Neither agree nor disagree with the statement
4- Agree with the statement
5- Strongly agree with the statement

1- Limiting the spread of AIDS is more important than trying to protect the rights of people with AIDS.
2- Support groups for people with AIDS would be very helpful to them.
3- I would consider marrying someone with AIDS.
4- I would quit my job before I would work with someone who has AIDS.
5- People should not be afraid of catching AIDS from casual contact, like hugging or shaking hands.
6- I would like to feel at ease around people with AIDS.
7- People who receive positive results from the AIDS blood test should not be allowed to get married.

8- I would prefer not to be around homosexuals for fear of catching AIDS.
9- Being around someone with AIDS would not put my health in danger.
10- Only disgusting people get AIDS.
11- I think that people with AIDS get what they deserve.
12- People with AIDS should not avoid being around other people.
13- People should avoid going to the dentist because they might catch AIDS from dental instruments.
14- The thought of being around someone with AIDS does not bother me.
15- People with AIDS should not be prohibited from working in public places.
16- I would not want to be in a same room with someone who I knew had AIDS.
17- The “gay plague” is an appropriate way to describe AIDS.
18- People who give AIDS to others should face criminal charges.
19- People should not be afraid to donate blood because of AIDS.
20- A list of people who have AIDS should be available to anyone.
21- I would date a person with AIDS.
22- People should not be afraid to donate blood because of AIDS.

23- No one deserves to have a disease like AIDS.
24- It would not bother me to attend class with someone with AIDS.
25- An employer should have the right to fire an employee with AIDS regardless of the type of work s/he does.
26- I would allow my children to play with the children of someone known to have AIDS.
27- People get AIDS by performing unnatural sex acts.
28- People with AIDS should not be looked down upon by others.
29- I could tell by looking at someone if s/he had AIDS.
30- It is embarrassing to have so many people with AIDS in our society.
31- Healthcare workers should not refuse to care for people with AIDS regardless of their personal feelings about AIDS.
32- Children who have AIDS should not be prohibited from going to schools or day care centers.
33- Children who have AIDS probably have a homosexual parent.
34- AIDS blood test results should be confidential to avoid discrimination against people with positive results.
35- AIDS is a punishment for immoral behavior.
36- I would not be afraid to take care of family member with AIDS.
37- If I discovered that my roommate had AIDS, I would move out.

38- I would contribute money to an AIDS research project if I were making a charitable contribution.
39- The best way to get rid of AIDS is to get rid of homosexuality.
40- Churches should take a strong stand against drug abuse and homosexuality to prevent the spread of AIDS.
41- Insurance companies should not be allowed to cancel insurance policies for AIDS-related reasons.
42- Money being spent on AIDS research should be spent instead on diseases that affect innocent people.
43- A person who gives AIDS to someone else should be legally liable for any medical expenses.
44- The spread of AIDS in the United States is proof that homosexual behavior should be illegal.
45- A list of people who have AIDS should be kept by the government.
46- I could comfortably discuss AIDS with others.
47- People with AIDS are not worth getting to know.
48- I have no sympathy for homosexuals who get AIDS.
49- Parents who transmit AIDS to their children should be prosecuted as child abusers.
50- People with AIDS should be sent to sanitariums to protect others from AIDS.
51- People would not be so afraid of AIDS if they knew more about the disease.
52- Hospitals and nursing homes should not refuse to admit patients with AIDS.

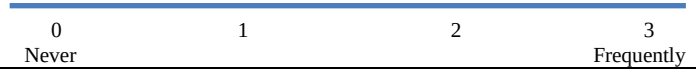
53- I would not avoid a friend if s/he had AIDS.
54- The spread of AIDS in our society illustrates how immoral the United States has become.

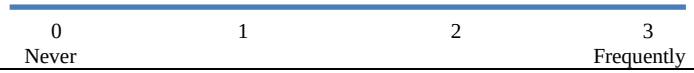
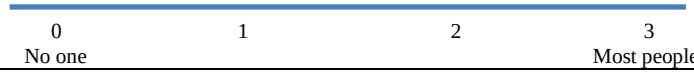
Steward et al. 2008

HIV-Related Stigma: Adapting a Theoretical Framework for Use in India"

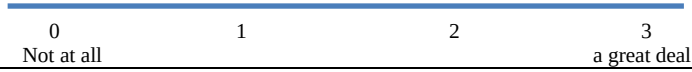
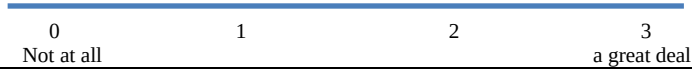
Newly developed measures of the stigma components were administered in a survey to **229 people** living **with HIV in South India.** (This was the part 2 of a study in which part 1 focused on qualitative measures to find out about the three types of stigma among PLWHA i.e. 1-enacted, 2-felt normative and 3-internalized forms of individual stigma experiences.)

Enacted stigma index	
Has a hospital worker mistreated you because of your HIV?	Yes No
Have people looked at you differently because you have HIV?	Yes No
Has a healthcare worker not wanted to touch you because you have HIV?	Yes No
Have you been told not to share your food or utensils with family because of your HIV?	Yes No
Have you been asked not to touch or care for children because of your HIV?	Yes No
Have you been refused medical care or denied hospital services because of your HIV?	Yes No

Have family members forced you to move out of your home because you have HIV?	Yes No
Has a hospital worker made your HIV infection publicly known by marking HIV on your medical record?	Yes No
Has someone threatened to hurt you physically because you have HIV?	Yes No
Have you been refused housing because people suspect you have HIV?	Yes No
Vicarious stigma (all items begin with the words, ‘‘**How often have you heard stories about**.’’)	
.a healthcare worker not wanting to touch someone because of his or her HIV?	
.people being mistreated by hospital workers because of their HIV?	
.people being refused medical care or denied hospital services because of their HIV?	
.a healthcare provider talking publicly about a patient with HIV?	
.someone being refused care from their family when they were sick with HIV?	
.people being forced by family members to leave their home because they had HIV?	

.a hospital worker making someone's HIV infection known by marking HIV on their medical records?	
.families avoiding any relative who has HIV?	
.people looking differently at those who have HIV?	
.a village/community ostracizing someone because they had HIV?	
Felt normative stigma scale (all item begin with the words, ''**In your community**,.'')	
.how many mothers would not want someone with HIV to hold their new baby?	
.how many mothers would not want healthcare professionals-infected person to feed their children?	
.how many people would not share dishes or glasses someone who has HIV?	
.how many people think that HIV-infected people have brought shame	

on their families?	0 No one 1 2 3 Most people
.how many people avoid visiting the homes of people with HIV?	0 No one 1 2 3 Most people
.how many people think that if you have HIV you have done wrong behaviors?	0 No one 1 2 3 Most people
.how many people would not want healthcare professionals-infected person cooking for them?	0 No one 1 2 3 Most people
.how many people think that people with HIV should feel guilty about it?	0 No one 1 2 3 Most people
.how many people think that a person with HIV is disgusting?	0 No one 1 2 3 Most people
.how many people think people with HIV are paying for their karma or sins?	0 No one 1 2 3 Most people
Internalized stigma scale (all items begin with the words, ‘‘**How much do you feel**.’’)	
.that you should avoid holding a new infant because of your HIV?	0 1 2 3

	Not at all a great deal
.that you should avoid feeding children because of your HIV?	
.that you should avoid sharing dishes or glasses just in case someone might catch HIV from you?	
.that you have brought shame to your family because you have HIV?	
.that you should avoid visiting people because of your HIV?	
.that you have HIV because you have done wrong behaviors?	
.that you should avoid cooking for people because you have HIV?	
.guilty about having HIV?	
.disgusting because of your HIV?	

.that you are paying for karma or sins because you have HIV?	

O'Hea et al 2001

The Attitudes toward Women with HIV/AIDS Scale (ATWAS): development and validation

The present researchers developed and validated the Attitudes toward Women with HIV/AIDS Scale (**ATWAS**). **225 psychology undergraduate students** participated in the study. This measurement tools was developed by adopting the short version of **Attitudes toward Women Scale** (AWS) and **Attitudes Toward AIDS Scale** (ATAS).

Child care					
1. Women who transmit HIV to their unborn baby should have their baby taken away.	Strongly agree	agree	not sure	disagree	strongly disagree
2. Women with HIV/AIDS are not in control of their own lives; therefore they are unfit to be in charge of anyone else.	Strongly agree	agree	not sure	disagree	strongly disagree
3. Women with HIV/AIDS are unfit mothers.	Strongly agree	agree	not sure	disagree	strongly disagree
4. I think women who give birth to babies who are HIV+ should be prosecuted for child abuse.	Strongly agree	agree	not sure	disagree	strongly disagree

5. Women with HIV/AIDS should NOT be allowed to make decisions about caring for their children.	Strongly agree agree not sure disagree strongly disagree
6. If a woman with HIV/AIDS gives birth to healthcare professionals-child, she should be able to raise that child.	Strongly agree agree not sure disagree strongly disagree
7. Women with HIV/AIDS should be allowed to have children.	Strongly agree agree not sure disagree strongly disagree
8. Young children should be removed from the home if their mother has HIV/AIDS.	Strongly agree agree not sure disagree strongly disagree
9. Pregnant women with HIV/AIDS should be forced to have an abortion	Strongly agree agree not sure disagree strongly disagree
10. Women with HIV/AIDS are failures because they cannot live up to the traditional roles of the woman as mother and caregiver.	Strongly agree agree not sure disagree strongly disagree
11. Women with HIV/AIDS should be sterilized (or have their tubes tied) so they cannot have children.	Strongly agree agree not sure disagree strongly disagree
Myths/Negative Stereotypes	
12. Most women with HIV/AIDS are injection drug users.	Strongly agree agree not sure disagree strongly disagree
13. Most women with HIV/AIDS are prostitutes or sex workers.	Strongly agree agree not sure disagree strongly disagree
14. Most women with HIV/AIDS sell their bodies for drugs.	Strongly agree agree not sure disagree strongly disagree
15. Most women with HIV/AIDS have been infected by their	Strongly agree agree not sure disagree strongly disagree

heterosexual partner who is an injection drug user.	
16. Most women with HIV/AIDS are lesbians.	Strongly agree agree not sure disagree strongly disagree
17. Most women with HIV/AIDS have slept around a lot.	Strongly agree agree not sure disagree strongly disagree
Reproduction/Contraception Issues	
18. Pregnant women with HIV/AIDS should be forced to have their baby tested for HIV.	Strongly agree agree not sure disagree strongly disagree
19. Pregnant women with HIV/AIDS should be forced to take medication (AZT) to reduce the chance that their babies will have HIV.	Strongly agree agree not sure disagree strongly disagree
20. I think women with HIV/AIDS should be allowed to breast-feed their baby, even if it puts the baby at risk of getting HIV.	Strongly agree agree not sure disagree strongly disagree
21. Women with HIV/AIDS should volunteer to have their baby tested for HIV.	Strongly agree agree not sure disagree strongly disagree
22. A woman owes it to her husband to have unprotected sex with him even if he has HIV/AIDS.	Strongly agree agree not sure disagree strongly disagree
23. It is OK for a man with HIV/AIDS to refuse to wear a condom if he pays the woman's bills.	Strongly agree agree not sure disagree strongly disagree
Sympathy/Transmission Route	
24. I feel more sympathetic toward women who get HIV/AIDS from	Strongly agree agree not sure disagree strongly disagree

blood transfusions than those who get it from injection drug use.	
25. I feel more sympathetic toward women who get HIV/AIDS from blood transfusions than those who get it from sexual intercourse.	Strongly agree agree not sure disagree strongly disagree
26. I feel more sympathetic toward women who get HIV/AIDS from being raped than through being sexually promiscuous.	Strongly agree agree not sure disagree strongly disagree
27. I have little sympathy for women who get HIV/AIDS from sexual promiscuity (Sleeping around).	Strongly agree agree not sure disagree strongly disagree

Fife and Wright 2000

The dimensionality of stigma: A comparison of its impact on the self of persons with HIV/AIDS and cancer

76 cancer patients of different types and 130 PLWHA of different stages were recruited to participate in this study. Comparison of the effects of the stigma associated with HIV/AIDS and cancer on self-esteem, body image and personal control was the focus of the study.

Four dimensions of perceived stigma: **Social rejection**, **Internalized shame**, **Social isolation**, and **financial insecurity** were examined.

Social Rejection	
1. My employer/ my co-workers have discriminated against me.	Agree Slightly Agree Uncertain Slightly Disagree Disagree*
2. Some people act as though I am less competent than usual.	Agree Slightly Agree Uncertain Slightly Disagree Disagree
3. I feel I have been treated with less respect than usual by the others.	Agree Slightly Agree Uncertain Slightly Disagree Disagree
4. I feel others are concerned they could "catch" my illness through contact like handshake or eating food I prepare.	Agree Slightly Agree Uncertain Slightly Disagree Disagree
5. I feel others avoid me because of my illness.	Agree Slightly Agree Uncertain Slightly Disagree Disagree

6. Some family members have rejected me because of my illness.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
7. I feel some friends have rejected me because of my illness.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
8. I encounter embarrassing situations as a result of my illness.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
9. Due to my illness others seem to feel awkward and tense when they are around me.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
Financial Insecurity					
10. I have experienced financial hardship that has affected how I feel about myself.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
11. My job security has been affected by my illness.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
12. I have experienced financial hardship that has affected my relationship with others.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
Internalized Shame					
1. I feel others think I am to blame for my illness.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
2. I do not feel I can be open with others about my illness.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
3. I fear someone telling others about my illness without my permission.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
4. I feel I need to keep my illness a secret.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
5. I feel I am at least partially to blame for my illness.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
Social Isolation					
6. I feel set apart from others who are well.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
7. I have a greater need than usual for reassurance that others care about me.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
8. I feel lonely more often than usual.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree

9. Due to my illness, I have a sense of being unequal in my relationship with others.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
10. I feel less competent than I did before my illness.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
11. Due to my illness, I sometimes feel useless.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree
12. Changes in my appearance have affected my social relationships.	Agree	Slightly Agree	Uncertain	Slightly Disagree	Disagree

*The ranking is an assumption.

Snell et al. 1991

The stereotypes about AIDS questionnaire (SAAQ)*

SAAQ measures 4 main categories of AID-related stereotypes with multiple subscales for each category. Four categories are:

- Global stereotypic beliefs about AIDS
- Personal attitudes about AID
- Medical issues about AIDS
- Sexual issues about AIDS

AIDS I

A = Agree B = Slightly Agree C = Neither Agree nor Disagree D = Slightly Disagree E = Disagree

1. Homosexuality is the cause of AIDS.	
2. People with AIDS don't really have a right to confidentiality about their disease.	
3. People ought to notify their employees if they contact AIDS.	
4. Not enough money is being spent on AIDS-related research.	
5. AIDS can be transmitted by being in the same room with an AIDS patient.	
6. People need education to learn how to avoid getting the virus AIDS.	
7. If it weren't for homosexuals, we wouldn't have the disease AIDS.	
8. AIDS victims have a right to privacy about their lives and lifestyles.	
9. Businesses should have the right to fire people if they have AIDS.	
10. The cost of medical care for AIDS patients should be paid by the government.	
11. AIDS can be transmitted by shaking hands with an AIDS patient.	
12. AIDS education is an appropriate task for schools to perform.	
13. The sexual promiscuity of homosexuals is the reason why AIDS exists.	

14. The government should be able to test anyone for AIDS.	
15. A person can get AIDS from fellow workers at a job.	
16. The government is not doing enough to fight AIDS.	
17. AIDS can be transmitted by sharing eating utensils with an AIDS patient.	
18. Sexual education about AIDS is necessary at school.	
19. AIDS is really a punishment sent from God for the sinful acts of homosexuality.	
20. AIDS infected children should be kept out of public school.	
21. Having a co-worker with AIDS would not bother me.	
22. AIDS is a serious national problem that deserves government attention.	
23. AIDS can be transmitted by kissing an individual with AIDS.	
24. It is important that students learn about AIDS in their classes.	
25. AIDS is God's way of getting rid of homosexuals.	
26. Identifying those people with AIDS should be a high priority.	
27. Employees have a right to know if any of their co-workers have AIDS.	
28. The Federal government ought to fund education on AIDS.	

29. People can catch AIDS by giving CPR to an individual with AIDS.	
30. Children need instruction about AIDS in their school curriculum	

AIDS II

A = Agree B = Slightly Agree C = Neither Agree nor Disagree D = Slightly Disagree E = Disagree

1. I don't want to talk or interact with anyone with AIDS.	
2. We have a social obligation to help those with AIDS.	
3. People who describe AIDS as an epidemic are exaggerating its true nature.	
4. As always, science will eventually find a cure for AIDS.	
5. AIDS is really not my problem; it's somebody else's.	
6. AIDS is not my problem.	
7. AIDS is not a threat to me.	
8. The AIDS crisis is really removed from me.	
9. People who die from AIDS are being punished for their past wrongs.	

10. People are blowing the issue of AIDS way out of proportion.	
11. People should test themselves for AIDS.	
12. People who get AIDS can blame only themselves.	
13. Only people from California have been affected by AIDS.	
14. Part of the problem with AIDS is that people don't talk about it.	
15. The AIDS epidemic will soon be a financial burden on the U.S. economy.	
16. You can't teach young children about AIDS.	
17. Men and women don't really need to discuss AIDS with each other.	
18. AIDS has become a significant problem in prison populations.	
19. A cure for AIDS is inevitable.	
20. AIDS is easy to get.	
21. AIDS may eventually bankrupt the U.S. healthcare system.	
22. People with AIDS should not be allowed to work in public school.	
23. People with AIDS should not be allowed to handle food in restaurants.	
24. People with AIDS should not be allowed to work with patients in hospitals.	

25. AIDS is not as big a problem as the media suggests.	
26. I am not the kind of person who is likely to get AIDS.	
27. I am less likely than most people to get AIDS.	
28. I'd rather get any other disease than AIDS.	
29. I've heard enough about AIDS, and I don't want to hear any more about it.	
30. Living in San Francisco would increase anyone's chances of getting AIDS.	
31. If a free blood test was available to see if you have the AIDS virus, I would take it.	
32. AIDS is God's punishment for immorality.	
33. AIDS patients offend me morally.	
34. If I knew someone with AIDS, it would be hard for me to continue that relationship.	
35. Children with AIDS should not be allowed to attend public schools.	

AIDS III

A = Agree **B = Slightly Agree** **C = Neither Agree nor Disagree** **D = Slightly Disagree** **E = Disagree**

1. The family of AIDS victims ought to have the right to participate in medical decisions.	
2. People with AIDS should not be admitted to medical hospitals.	
3. Doctors can catch AIDS if they treat patients with this disease.	
4. AIDS patients will contaminate medical staff and other hospital patients.	
5. It's important to maintain a safe blood banking system, because of AIDS.	
6. Healthcare workers can catch AIDS in medical situations.	
7. Medicine has a test to identify whether a person has AIDS.	
8. The medical test for AIDS will not always identify a recently-infected person.	
9. There's a vaccine that prevents the spread of AIDS.	
10. There are effective medical treatments for those with AIDS.	
11. Doctors and nurses are at risk for catching AIDS from infected patients.	
12. No medical assistance person has ever caught AIDS from a patient.	
13. AIDS blood tests should be administered to everyone in hospitals.	
14. Hospitals should have the right to test all patients for AIDS.	
15. A doctor with AIDS should not be allowed to treat patients.	

16. A hospital worker should not be required to work with AIDS patients.	
17. AIDS patients have as much right to quality medical care as anyone else.	
18. AIDS makes a medical job a high-risk occupation.	
19. Dealing with AIDS patients is different from dealing with other types of patients.	
20. The high cost of treating AIDS patients is unfair to other people in need of care.	
21. Working with AIDS patients can be a rewarding experience for medical personnel.	
22. Hospital personnel should go out of their way to be helpful to a patient with AIDS.	
23. People with AIDS can be cured if they seek medical attention.	
24. To get AIDS, a person must have intimate sexual or blood contact with an AIDS carrier.	
25. The disease AIDS can be transmitted by the exchange of blood (or blood products).	
26. AIDS has been identified in hemophiliacs (people who bleed easily).	
27. AIDS has been linked to blood transfusion.	
28. AIDS is probably in most of the nations' blood supply.	
29. A blood test can identify testing for AIDS.	
30. People get AIDS from blood transfusion.	

AIDS IV

A = Agree B = Slightly Agree C = Neither Agree nor Disagree D = Slightly Disagree E = Disagree

1. AIDS is a serious challenge to the notion of recreational sex.	
2. Because of AIDS, everyone has a responsibility to practice healthful sexual behaviors.	
3. Condoms offer protection against the spread of AIDS.	
4. AIDS cannot be transmitted by heterosexual (male-female) sexual activity.	
5. People catch AIDS from their sexual partners.	
6. The more sexual partners people have, the greater their chance of acquiring AIDS.	
7. AIDS is associated with multiple anonymous sexual contacts.	
8. AIDS is transmitted by intimate sexual contact.	
9. People can contact AIDS even though they have had sex with only one person.	
10. Condoms are a safe shield against AIDS.	
11. AIDS is essentially a sexually transmitted disease.	
12. People can contract AIDS from sexual contact with a single infected person.	

13. Any sexually active people can get AIDS.	
14. People get AIDS from sex.	
15. People don't engage in sex very much nowadays because of AIDS.	
16. AIDS is transmitted primarily through sexual relations.	
17. Proper use of condoms can reduce the risk of catching AIDS.	
18. The use of condoms can prevent the spread of AIDS.	
19. Heterosexuals who use condoms can lessen their risk for getting AIDS.	
20. People who have "one-night stands" will probably catch AIDS.	

*Reliability testing of the above-mentioned scales shows all of the four scales are validated and reliable in measuring the personal attitudes about AIDS.

Kalichman et al 2004

Traditional beliefs about the cause of AIDS and AIDS-related stigma in South Africa

A Street intercepts survey (self-administered questionnaire) about AIDS and AIDS-related stigma with **487 men and women** living in a Black township in Cape Town, **South Africa.**

Those who answered the **first question** by choosing **"I don't know"** were **eliminated** from the further analysis. **Brown et al measurement tool** was adopted as a part of the questionnaire used in this study.

1- HIV/AIDS is caused by spirits and supernatural forces	Yes	No	I don't know
Casual contagion			
2- Is AIDS spread by kissing?	Yes	No	I don't know
3- Can a person get AIDS by sharing kitchens and bathrooms with someone who has AIDS?	Yes	No	I don't know
4- Can you get AIDS by touching someone with AIDS?	Yes	No	I don't know
Transmission/prevention			
5- Can men give AIDS to women?	Yes	No	I don't know
6- Can women give AIDS to men?	Yes	No	I don't know
7- Must a person have many different partners to get AIDS?	Yes	No	I don't know
8- Does washing after sex help protect against AIDS?	Yes	No	I don't know
9- Can a pregnant woman give AIDS to her baby?	Yes	No	I don't know
10- Can a person get rid of AIDS by having sex with a virgin?	Yes	No	I don't know
Disease processes			
11- Is HIV the virus that causes AIDS?	Yes	No	I don't know

12- Is there a cure for AIDS?	Yes		No		I don't know
Repulsion (Adopted from Brown et al 2003)					
13- People who have AIDS are dirty.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
14- People who have AIDS are cursed.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
15- People who have AIDS cannot be trusted.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
16- People who have AIDS should be ashamed.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
17- People who have AIDS have nothing to feel guilty about.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
18- Most people become HIV-positive by being weak or foolish.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
Social Sanctions					
19- It is safe for people who have AIDS to work with children.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
20- People who have AIDS must expect some restrictions on their freedom.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
21- A person with AIDS must have must have done something wrong and deserves to be punished.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
22- People who have AIDS should be isolated.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*
23- I don't want to be friends with someone who has AIDS.	Definitely yes	Probably yes	Probably no	Definitely no	Don't know*

24- People who have AIDS should not be allowed to work	Definitely yes Probably yes Probably no Definitely no Don't know*

*The proposed Likert scale is an assumption and there is no assurance about the appropriateness of "I don't know" option.

UNAIDS report 2000

Protocol for the identification of discrimination against people living with HIV by UNAIDS

Area	***Required by Law***	***Required by internal regulations or procedures***	***Occurring in practice***
I. Healthcare			
1. Refusal to treat on grounds of HIV/AIDS status.			
2. Different treatment on grounds of HIV/AIDS status.			
3. Testing without knowledge.			
4. Refusal to inform a person of the result of healthcare professionals test.			
5. Health controls, quarantine, compulsory internment, and/or segregation in hospital, clinic, nursing home etc.			
6. Compulsory notification of HIV/AIDS status to			

sexual partner(s) and/or relative(s).			
7. Non-confidentiality: supplying names of individuals found to be HIV-positive to any other party, or knowingly or negligently allowing confidential files to be consulted.			
II. Employment			
8. Mandatory testing at recruitment.			
9. Mandatory testing during employment.			
10. Questions on recruitment forms and/or during interview related to HIV/AIDS status and/or 'lifestyle'.			
11. Lack of confidentiality regarding HIV/AIDS status.			
12. Dismissal, or change(s) in conditions of employment, on grounds of HIV/AIDS status.			
13. Restrictions due to HIV/AIDS status (e.g. promotion, job location, training and/or employment benefits).			
14. Denial of employment on grounds of HIV/AIDS status.			
III. Justice/Legal process			

15. Criminalization of behavior (such as prostitution or men having sex with men) considered to be conducive to spreading HIV.			
16. Creation of specific criminal offences for deliberate transmission of HIV/AIDS.			
17. Inequality before the law for persons living with HIV/AIDS and in relation to groups regarded as at risk of HIV/AIDS (e.g. refusal to pursue a prosecution where victim is a PLWHA, and denial or limitation of due process protections, including rights of review and appeal, and rights of representation, notice and privacy).			
18. Difference in conviction and/or sentencing on grounds of HIV/AIDS status.			
IV. Education			
19. Denial of access to education on grounds of HIV/AIDS status.			
20. Restrictions imposed in an educational setting on grounds of HIV/AIDS status (e.g. segregation).			
V. Reproductive and family life			
21. Mandatory premarital testing.			
22. Mandatory prenatal testing.			
23. Mandatory abortion/sterilization of women with			

HIV/AIDS.			
24. Withdrawal, or modification, of conditions of exercise of parental custody, support, and inheritance rights due to HIV/AIDS status.			

Yiu et al. 2010

Effectiveness of a knowledge-contact program in improving nursing students' attitudes and emotional competence in serving PLWHA.

102 **nursing students** enrolled in the bachelor's program in nursing in **Hong Kong University**. **89** returned the questionnaire.

	Yes	**No**	**Don't Know**
1) AIDS is a set of symptoms resulting from the damages to human immune systems.	1	2	3
2) There is no cure for HIV/AID.	1	2	3
3) HIV can be transmitted by blood and blood products	1	2	3
4) HIV can be transmitted by casual contact with persons who are HIV carrier.	1	2	3
5) Sexual transmission of HIV occur in both homosexual and heterosexual relationships	1	2	3
6) Consistent use of condoms may decrease transmission of the HIV	1	2	3

7) Healthcare workers who are pregnant and use proper precautions are still at increased risk of contracting the HIV	1	2	3
8) The AIDS virus is found in high concentrations in blood, semen and vaginal secretions.	1	2	3
9) There is no drug to treat or control the majority of the complications resulting from HIV infection	1	2	3
10) Wearing medical latex gloves is not one of the effective means of protecting oneself from HIV-infection	1	2	3
11) To prevent HIV-infection, appliances used for treating the HIV/AIDS patients should be sterilized	1	2	3
12) HIV can be transmitted through unsafe oral sex	1	2	3
13) HIV can be transmitted through mouth-to-mouth kissing	1	2	3
14) HIV can be transmitted through mosquito bites HIV	1	2	3
15) Universal precautions (all blood and body fluids are treated as potentially infectious) are the major precaution of infection control applicable to taking care patients of HIV/AIDS	1	2	3
16) Using barrier to avoid direct contact with blood and body fluid is a major precaution of infection control applicable to taking care of patients with HIV/AIDS	1	2	3
17) Most of HIV-infected people will progress to AIDS in 8- 12 years' time without any treatment	1	2	3
Please circle the right answer.			
18) The window periods, i.e. time taken from HIV infection to positive HIV antibody test is usually			

a) less than 3 months b) 3-6 months c) 7-9 months d) more than 9months
19) The chance of being infected by healthcare professionals-contaminated needle-stick injury is a) less than 1% b) 5% c) 10% d) 20%
20) In Hong Kong the risk of HIV-infected woman transmitting the infection to her infant is a) less than 10 % b) 10-40% c) 41%-64%, d) 65%-90% e) more than 90%

Scale: Stigmatizing Attitudes

1: Strongly Disagree 2: Disagree 3: Slightly Disagree 4: Slightly Agree 5: Agree 6: Strongly Agree

21) All HIV-infected patients should be isolated from other patients in the wards.
22) I should have the right to refuse to care for a patient with HIV/AIDS.
23) I am reluctant to have physical contact with patients with HIV/AIDS to whom I provide the care.
24) The workers in my profession should keep HIV positive persons' particulars confidential.
25) I would have to ask for a transfer to another unit if I had to care for a patient with HIV/AIDS on a regular basis.
26) I would feel uncomfortable treating patients with HIV/AIDS.
27) Patients with HIV/AIDS are revolting.
28) Having a co-worker with HIV/AIDS would not bother me.
29) I am sympathetic to patients with HIV/AID.
30) I feel more angry when caring for a patient with HIV/AIDS than a patient with infectious hepatitis.
31) Healthcare agencies should have the right to refuse to provide care to patients with HIV/AIDS.

32) Patients with HIV/AIDS are to be blamed for their condition.
33) Nurses should be assigned to care for patients with HIV/AIDS on a voluntary basis only.
34) All healthy HIV-infected health workers should be excluded from clinical work.
35) Patients with HIV/AIDS have the right to the same quality of care as any other patient.

Scale: Fear of Contagious

1: Strongly Disagree **2: Disagree** **3: Slightly Disagree** **4: Slightly Agree** **5: Agree** **6: Strongly Agree**

36) I am more frightened when caring for a patient with HIV/AIDS than a patient with other infectious diseases.
37) I am fearful of contracting HIV when caring for patient with HIV/AIDS
38) The major concerns I have about caring for a patient with HIV/AIDS are “will I get AIDS?
39) If I care for patients with HIV/AIDS, I shall worry about putting my family, friends, or colleagues at risk.
40) I would refuse to care for patients with HIV/AIDS.

Scale: Willingness to Treat

1: Strongly Disagree 2: Disagree 3: Slightly Disagree 4: Slightly Agree 5: Agree 6: Strongly Agree

Zelaya et al. 2008

HIV/AIDS stigma: reliability and validity of a new measurement instrument in Chennai, India.

The paper reports the development and psychometric testing of healthcare professionals/AIDS stigma scale among **200 men in South India**. This **24-item** scale and distinct subscales suggest a valid and reliable measure for HIV/AIDS stigma in a setting with highly prevalent HIV risk behaviors.

fear of transmission and disease	
1. If you kiss someone on the cheek that has HIV/AIDS, you might get infected (Herek and Capitanio 1993)	strongly disagree disagree agree strongly agree no opinion
2. If you are coughed or sneezed on by someone who has HIV/AIDS, you are likely to contract the infection (Herek and Capitanio 1993)	strongly disagree disagree agree strongly agree no opinion
3. I fear I could become infected with HIV if I were to be exposed to the saliva of a person who has HIV/AIDS (Nyblade et al. 2005)	strongly disagree disagree agree strongly agree no opinion
4. I fear I could become infected with HIV if I were to be exposed to the sweat of a person who has HIV/AIDS (Nyblade et al. 2005)	strongly disagree disagree agree strongly agree no opinion
5. I fear I could become infected with HIV if I were to be exposed to the feces or urine	strongly disagree disagree agree strongly agree no opinion

of a person who has HIV/AIDS (Nyblade et al. 2005)	
6. I fear my child could become infected with HIV if they play with a child who has HIV or AIDS (Nyblade et al. 2005)	strongly disagree disagree agree strongly agree no opinion
association with shame, blame and judgment	
7. HIV/AIDS is a punishment for bad behavior (Nyblade et al. 2005)	strongly disagree disagree agree strongly agree no opinion
8. It is women prostitutes that spread HIV in the community (Nyblade et al. 2005)	strongly disagree disagree agree strongly agree no opinion
9. People with HIV are promiscuous (Nyblade et al. 2005)	strongly disagree disagree agree strongly agree no opinion
10. Only those who were infected with HIV by medical needles or blood in a hospital deserve to receive care and treatment (New)	strongly disagree disagree agree strongly agree no opinion
11. If the young people in our community associate or interact with a person who has HIV/AIDS, they may be influenced to participate in immoral or illicit activities (New)	strongly disagree disagree agree strongly agree no opinion
12. People who have HIV/AIDS should be given treatment and care, only if they stop participating in immoral or illicit activities (New)	strongly disagree disagree agree strongly agree no opinion
personal support of discriminatory actions or policies	
13. People living with HIV/AIDS in this community should be treated the same by	strongly disagree disagree agree strongly agree no opinion

healthcare professionals as people with other illnesses (NIMH Project Accepta)	
14. A person with HIV/AIDS should be allowed to work with other people (NIMH Project Accepta)	strongly disagree disagree agree strongly agree no opinion
15. People with HIV should be allowed to participate in social events in this community (NIMH Project Accepta)	strongly disagree disagree agree strongly agree no opinion
16. People with AIDS should be isolated from other people (NIMH Project Accepta)	strongly disagree disagree agree strongly agree no opinion
17. People who have HIV/AIDS should be treated the same as everyone else (NIMH Project Accepta)	strongly disagree disagree agree strongly agree no opinion
18. If a teacher has HIV, but is not sick, they should be allowed to continue teaching in school (FHIb)	strongly disagree disagree agree strongly agree no opinion
perceived community support of discriminatory actions or policies	
19. People living with HIV/AIDS in this community face neglect from their family (NIMH Project Accepta)	strongly disagree disagree agree strongly agree no opinion
20. People want to be friends with someone who has HIV/AIDS (NIMH Project Accepta)	strongly disagree disagree agree strongly agree no opinion
21. People living with HIV/AIDS in this community face ejection from their homes by their families (NIMH Project Accepta)	strongly disagree disagree agree strongly agree no opinion
22. People living with HIV/AIDS in this community face rejection from their peers (NIMH Project Accepta)	strongly disagree disagree agree strongly agree no opinion

23. People living with HIV/AIDS in this community face verbal abuse or teasing (NIMH Project Accepta)	strongly disagree	disagree	agree	strongly agree	no opinion
24. People with HIV/AIDS in this community are abandoned by their spouse or partner (Nyblade et al. 2005)	strongly disagree	disagree	agree	strongly agree	no opinion

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